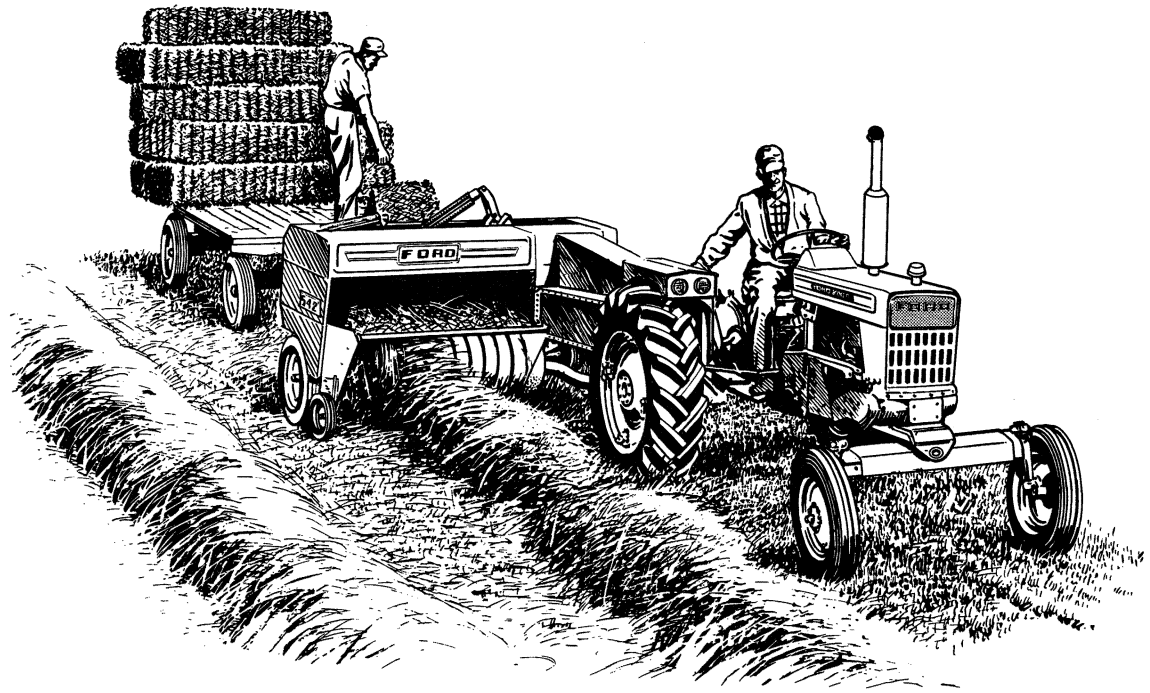
FORD

Operator's Manual

Hay Balers
Series 532 & 542

42053220



Reprinted

SERIES 532 AND 542 HAY BALERS OPERATOR'S MANUAL SUPPLEMENT

GENERAL INFORMATION

This publication is provided to supplement or supersede the information contained in the Ford Series 532 and 542 Hay Balers Operator's Manual, SE 03245. it is suggested that you mark the pages of your operator's manual to indicate the portion of information which has been supplemented or superseded. Keep this supplement with your operator's manual for easy reference to both publications.

TIMING INNER FEED FORK

The following information supplements the "Timing Inner Feed Fork" adjustment information on page 15 of your operator's manual.

When timing the inner feed fork to the plunger (Step 4, page 15, of your operator's manual, the adjustment must be made with the feed fork tines flush to 1" above the vertical flange of the feed fork stripper slot, with the adjusting bolt in the second hole from the left, the curved end of the block facing left, and the connector pin positioned in the middle hole of the feed fork as shown in Figure 1. Failure to do so will result in incorrect feed fork timing.

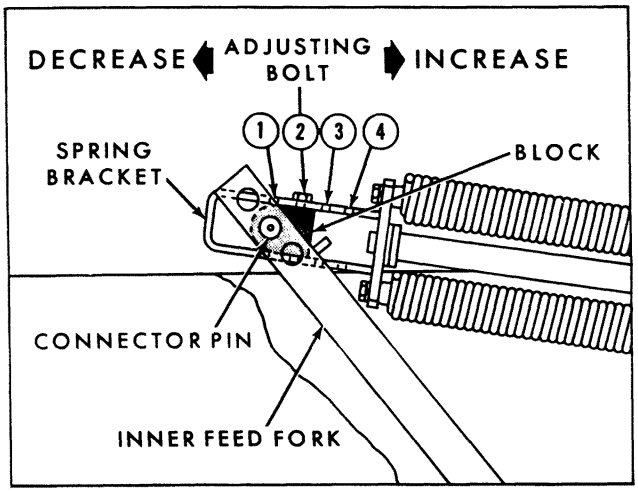


Figure 1
Inner Feed Fork Adjustment

FEED FORKS

The following information supersedes the "Feed Fork" information on page 16 of your operator's manual.

Density across the bale is regulated by the volume of hay being fed into the baler, proper adjustment of the feed platform access door, installation of the feed baffle, and the depth the inner feed fork penetrates into the bale chamber.

If the bales are curved to the left as they come out of the bale chamber, they are not dense enough on the left side. To correct this condition, more hay must be pushed further across the bale chamber. This can be accomplished by increasing the ground speed and/or windrow size. If this does not correct the condition, the inner feed fork penetration should be increased, and, if necessary, the feed baffle installed and/or the feed platform access door moved forward.

The inner feed fork penetration will increase progressively as the following adjustments are performed in the order listed below.

1. Reposition the adjusting bolt, Figure 1, in the next hole, (3) or (4), to the right (facing direction of baler travel).

2. Remove the connector pin, turn the bearing block end-for-end so that the curved end is to the right, and insert the adjusting bolt in hole (3).

3. Remove the connector pin, reposition the spring bracket downward, and install the connector pin in the lower hole of the feed fork.

NOTE: *A stop lug located near the bottom hole of the feed fork prevents installing the connector pin in the lower hole of the feed fork when the curved end of the bearing block is facing left.*

NOTE: *Maximum inner feed fork penetration will be obtained with the adjusting bolt inserted in hole (3) of the spring bracket, with the bearing block turned so that the curved end is to the right, and the connector pin positioned in the bottom hole of the feed fork.*

Conversely, if the bales are curved to the right as they come out of the bale chamber, they are not dense enough on the right side. This condition may be corrected by reducing the ground speed and/or windrow size. If this does not correct the condition, the inner feed fork penetration should be decreased, and, if necessary, the feed platform access door moved rearward, and/or the feed baffle removed from the feed house opening.

The inner feed fork penetration will decrease progressively as the following adjustments are performed in the order listed below.

1. Reposition the adjusting bolt, Figure 1, in the next hole (1) to the left, with the curved end of the bearing block facing left (facing direction of baler travel).

2. Remove the connector pin, reposition the spring bracket upward, and install the connector pin in the upper hole of the feed fork. Then reposition the adjusting bolt in hole (2), or for even less penetration, hole (1).

NOTE: *Minimum inner feed fork penetration will be obtained with the adjusting bolt inserted in hole (1) of the spring bracket, with the bearing block turned so that the curved end is to the left, and the connector pin positioned in the top hole of the feed fork.*

The inner feed fork is spring loaded to provide protection against overloading. **If the feed fork connecting rod begins to telescope and knock, decrease the volume of material being fed into the baler.**

NOTE: *It is not necessary to retime the inner feed fork to the plunger after the inner feed fork penetration has been adjusted.*

FORD

SERIES 532 AND 542

HAY BALERS

OPERATOR'S

MANUAL

SUPPLEMENT

FOREWORD

THIS SUPPLEMENT CONTAINS INFORMATION RELATING TO THE TWINE DISC AND KNOTTER ASSEMBLY FOR THE FORD SERIES 532 AND 542 HAY BALERS, AND SUPERSEDES THE INFORMATION CONTAINED IN THE OPERATOR'S MANUAL, SE 03245. IT IS SUGGESTED THAT YOU MARK THE PAGES OF YOUR MANUAL TO INDICATE THE PORTION OF INFORMATION THAT HAS BEEN SUPERSEDED.

READ THIS SUPPLEMENT CAREFULLY AND KEEP IT WITH THE OPERATOR'S MANUAL FOR REFERENCE. IF, AT ANY TIME, YOU HAVE ANY QUESTIONS ABOUT YOUR HAY BALER, YOUR FORD TRACTOR–EQUIPMENT DEALER IS BEST QUALIFIED TO HELP YOU. HE HAS FACTORY-TRAINED SERVICE TECHNICIANS, GENUINE FORD PARTS, AND THE CORRECT TOOLS AND EQUIPMENT TO DO THE JOB RIGHT IN THE SHORTEST POSSIBLE TIME.

SERVICE DEPARTMENT
FORD TRACTOR OPERATIONS
FORD MOTOR COMPANY

ADJUSTMENTS

TWINE DISC

The following information supersedes the "Twine Disc" information on page 30 of your operator's manual.

To receive the twine, the notches in the twine discs must be in proper relationship to the twine holder. The twine disc timing may be checked with or without twine in the twine holder. With twine in the holder the twine disc timing is correct if the right-hand edge of the notch in the disc leads slightly into the twine holder as shown in Figure 1.

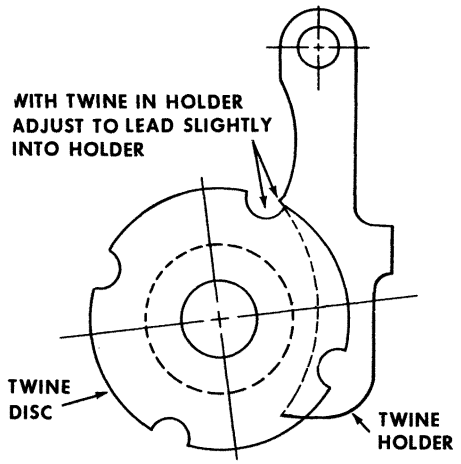


Figure 1
Twine Disc Adjustment with Twine in Holder

Without twine in the holder, the timing is correct if the center of the notch aligns with the left-hand edge of the holder. Closely observe Figure 2 which shows the disc properly positioned without twine in the holder.

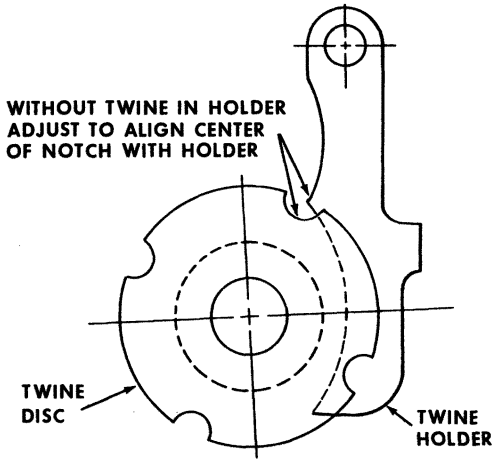


Figure 2
Twine Disc Adjustment without Twine in Holder

If adjustment is necessary, loosen the worm gear nut, then rotate the worm gear in the direction of shaft rotation to advance the disc until the proper relationship exists. Tighten the nut to secure the gear in position on the tapered shaft.

NOTE: *Rotating the worm gear in the direction of shaft rotation will remove any backlash between the worm gear and twine disc pinion.*

KNOTTER ASSEMBLY

The following information supersedes the information relating to the maintenance of the knotter assembly on pages 50 through 52 of your operator's manual.

Performing preventive maintenance on the knotter assembly will help maintain trouble-free operation during the entire baling season. Periodically check the machined surface on the cam gears, bill hook pinions, and twine disc pinions for wear. Also check the cam gears and knotter assemblies for excessive end play on the knotter shaft, and the cleaner plates for free floating action in the twine discs.

CHECKING THE KNOTTER STACK

End play among the components assembled on the knotter shaft is determined by measuring the clearance between the bill hook pinion and cam gear on each knotter assembly. After extensive use, the bill hook-to-cam gear clearances should be checked, and if necessary, adjusted. Excessive end play will accelerate wear, and if not corrected, can result in breakage of knotter parts. When the combined bill hook pinion-to-cam gear clearance for both knotter assemblies exceeds .045" due to wear, the knotter stack should be adjusted to obtain a combined clearance of .007" – .021".

Check the knotter stack clearances as follows:

1. Remove the knotter frame mounting bolts and pivot the knotter frames upward.

2. Check the components on the knotter shaft to make sure they are free to move laterally.

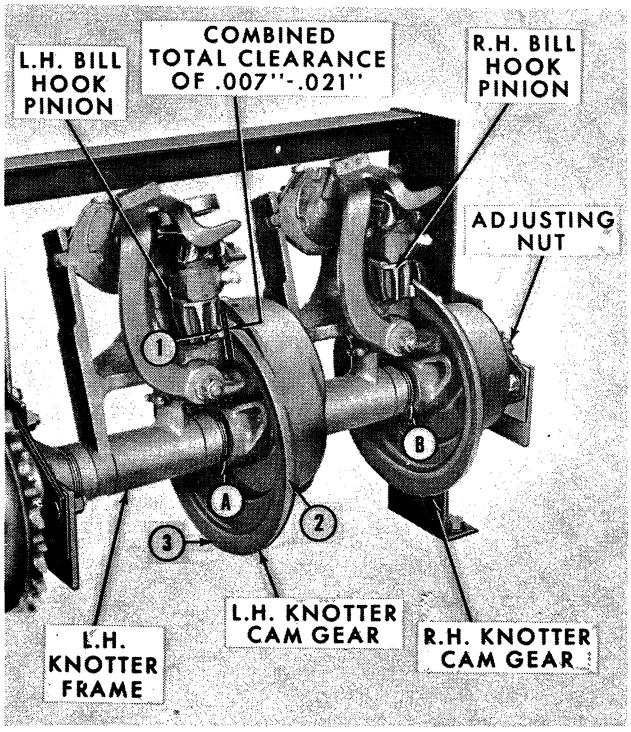


Figure 3
Bill Hook-to-Cam Gear Clearance
(Knotter Shown Assembled on Workbench Stand For Illustration Purposes)

3. Insert a screwdriver or other appropriate tool at point "A", Figure 3. Apply lateral pressure with the screwdriver and spread the left-hand knotter cam gear until the flat of the right-hand bill hook pinion contacts the machined face of the right-hand knotter cam gear.

   NOTE: *Removing the clearance between the right-hand bill hook pinion and cam gear will permit the combined bill hook-to-cam gear clearance to be measured on the left-hand knotter assembly.*

4. While maintaining slight lateral pressure with the screwdriver or other tool, measure the distance between the flat of the left-hand bill hook pinion and the machined face of the knotter cam gear at locations (1), (2), and (3), Figure 3. The dimensions represent the combined bill hook-to-cam gear clearances for both knotter assemblies and should not be less than .007" nor more than .021" at any of the three locations.

   NOTE: *It may be necessary to rotate the knotter cam gears to obtain the three measurements. To rotate the gears, disconnect the needle yoke drive rod from the needle yoke assembly and manually rotate the knotter clutch arm until the cam gear is in the required position.*

5. Repeat the check on the right-hand knotter assembly inserting the screwdriver or other tool at point "B", Figure 3. Spread the right-hand knotter frame from the right-hand knotter cam gear until the left-hand knotter cam gear contacts the flat of the left-hand bill hook pinion. The dimensions should be the same as those taken on the left-hand knotter assembly.

   NOTE: *Removing the clearance between the left-hand knotter cam gear and bill hook pinion will permit the combined bill hook-to-cam gear clearance to be measured on the right-hand knotter assembly.*

6. If the measurements taken on the knotter assemblies are in excess of .021", remove the cotter pin from the adjusting nut, Figure 3, and tighten as necessary to obtain the required .007" – .021" clearance. Each slot of the nut will increase or decrease the clearance by .014". Reinstall the cotter pin through the nut and shaft.

   IMPORTANT: *Do not turn the adjusting nut more than finger tight. Excessive tightening may cause binding between the cam gears and bill hook pinions, resulting in premature wear. If a total bill hook pinion-to-cam gear clearance of .007" – .021" cannot be obtained by means of the adjusting nut, it may be necessary to remove one or more of the spacers at points "A" and/or "B", Figure 3, to enable the cam gears to be adjusted to the bill hook pinions. This will require removing the knotter assembly from the baler and restacking it as outlined in the procedure below.*

RESTACKING THE KNOTTER ASSEMBLY

If the knotter assembly cannot be adjusted by means of the adjusting nut or requires new parts, remove the assembly from the baler and disassemble it. Then reassemble and install it per the following procedure and in the order listed. Doing so will prevent time consuming trial and error assembly methods. Refer to Figures 4 and 5 during the assembly procedure.

1. Install the locking collar (1), Figure 4, on the knotter shaft by installing the rolled pin through the collar and shaft.

ADJUSTMENTS

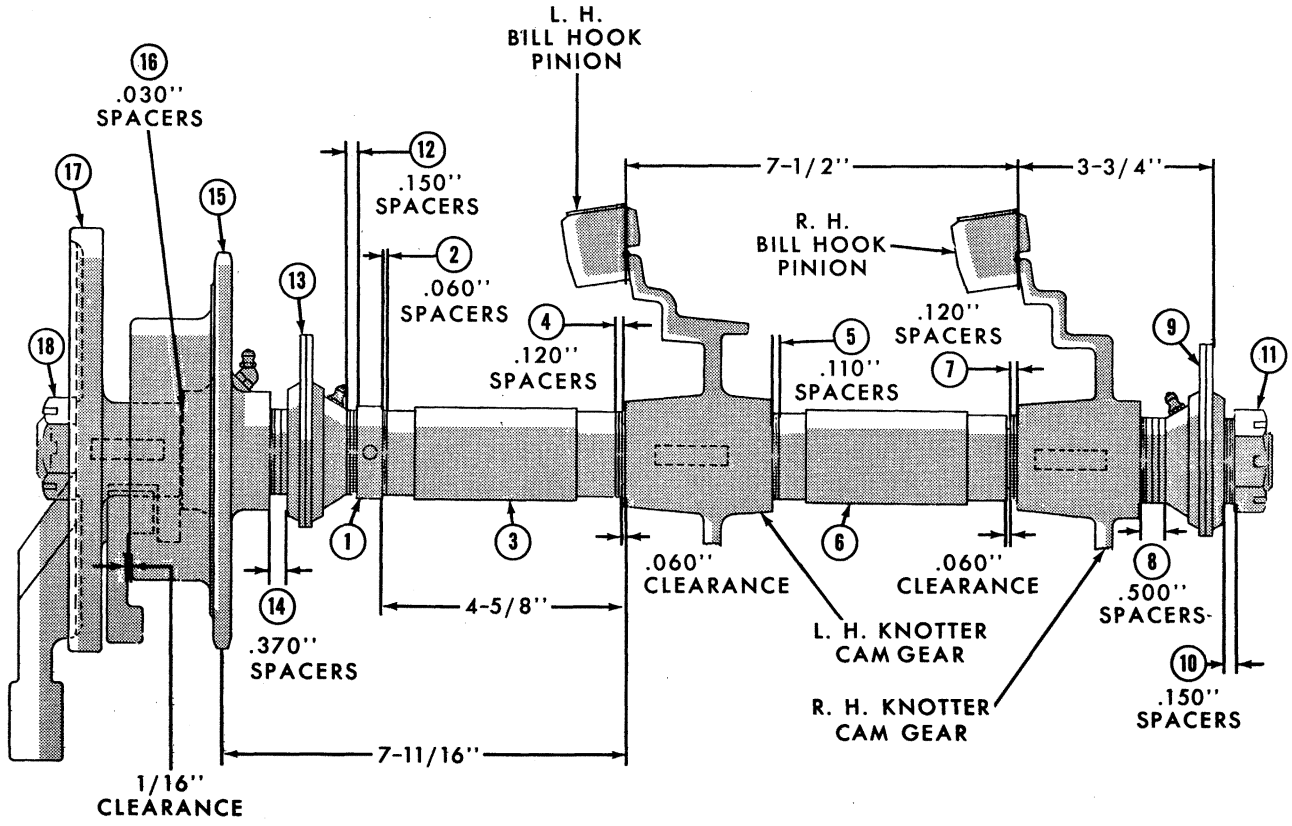


Figure 4
Knotter Assembly Stack-Up Dimensions

2. Working from left to right, install approximately .060" spacers (2), on the shaft, then install the left-hand knotter frame assembly (3).

3. Install 0.120" spacers (4), on the shaft, then install the key and the left-hand knotter cam gear. Make certain the gear slides freely over the key. The gear must be free to move laterally when all of the components are assembled on the knotter shaft.

4. Slide the cam gear to the left so that the machined face of the gear contacts the flat of the left-hand bill hook pinion. Measure the 4-5/8" dimension from the face of the collar to the hub of the left-hand knotter cam gear. A tolerance of plus or minus 1/32" is permissable. If necessary, add or remove the knotter spacers (2), to obtain the 4-5/8" dimension.

NOTE: *A clearance of up to 0.060" should exist between the spacers (4), and the cam gear when the gear is moved against the flat of the bill hook pinion.*

5. Continue assembling the components on the knotter shaft by installing approximately 0.110" spacers (5), and the right-hand knotter frame assembly (6).

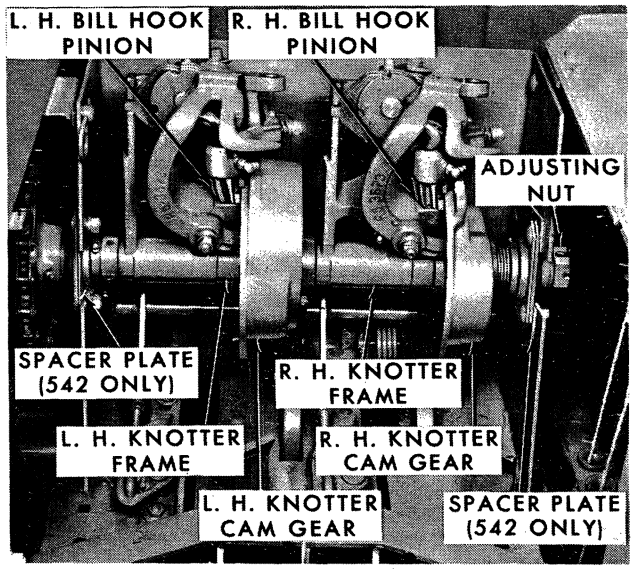


Figure 5
Knotter Assembly Installed

6. Install .120" spacers (7), on the shaft, then install the key and the right-hand knotter cam gear. Make certain the gear slides freely over the key. The cam gear must be free to move laterally when all components are assembled on the shaft.

7. Slide the right-hand knotter cam gear to the left so that the machined surface of the gear contacts the flat of the right-hand bill hook pinion. Measure the 7-1/2" dimension between the two machined surfaces on the knotter cam gears. A tolerance of plus or minus 1/32" is permissable. If necessary, add or remove knotter spacers (5) to obtain the 7-1/2" dimension.

   NOTE: *A clearance of up to 0.060" should exist between the spacers (7), and the cam gear when the cam gear is moved against the flat of the bill hook pinion.*

8. Install approximately 0.500" spacers (8), the right-hand flanged bearing assembly (9) (with mounting bolts installed), 0.150" spacers (10), and the adjusting nut (11). Tighten the nut to remove any end play in the knotter stack, then back it off until the bearing is allowed to rotate freely. Do not install the cotter pin at this time.

9. Check the alignment of the bearing flanges by spinning the bearing. Adjust the flanges to run as true as possible.

10. With a square or other straight edge positioned as shown in Figure 6, measure the distance between the machined surface of the right-hand knotter cam gear and the outer surface of the right-hand flanged bearing assembly. The measurement should be 3-3/4" plus or minus 1/32". Add or remove spacers (8), as required to obtain the dimension.

11. Tighten the adjusting nut (11), Figure 4, to remove all end play in the knotter stack, then loosen the nut 1/12 to 3/12 of a turn and install the cotter pin through the nut and shaft. If the cotter pin cannot be installed, it may be necessary to remove one or more of the spacers (10).

12. Check the combined bill hook pinion-to-cam gear clearance for both knotter assemblies as outlined under "Checking the Knotter Stack," page 3 of this supplement. The combined bill hook-to-cam gear clearance for both knotter assemblies must not be less than .007" nor more than .021". Adjust if necessary.

13. Install .150" spacers (12), Figure 4, next to the collar (1), then slide the left-hand flanged bearing assembly (13) on the shaft.

14. Position the assembled knotter shaft between the knotter housing side plates, Figure 5. Bolt the flange of each bearing to the left-hand side of the plates as shown.

    IMPORTANT: Series 542 Hay Balers Only: *Be sure to install the 0.100" spacer plates between the bearing flanges and the knotter housing plates as shown in Figure 5. The plates compensate for the variance between the Series 532 and Series 542 bale chamber widths.*

15. Install approximately 0.370" spacers (14), Figure 4, on the knotter shaft, then install the clutch sprocket (15).

16. Measure the 7-11/16" dimension between the the machined surface of the left-hand knotter cam gear and the center of the teeth on the clutch sprocket, while holding the sprocket against the spacers (14). The dimension is used to determine if the clutch sprocket is properly aligned with the drive sprocket. A tolerance of plus or minus 1/32" is acceptable. If necessary, remove the sprocket and add or remove spacers (14), as required to obtain the 7-11/16" dimension.

17. Install approximately 0.030" spacers (16), on the knotter shaft, then install the key and the knotter cam assembly (17).

18. With the cam assembly held against the spacers (16), check the 1/16" clearance between the

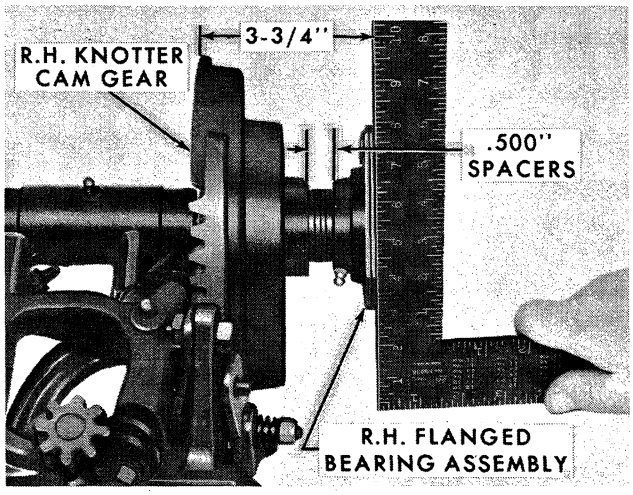


Figure 6
Cam Gear-to-Bearing Flange Measurement

edge of the clutch pawl and the clutch sprocket. If necessary, remove the cam assembly and add or remove the spacers (16), until the clearance is obtained.

19. Secure the parts on the shaft by installing the knotter shaft nut (18). Tighten the nut, then back it off until the sprocket assembly is allowed to revolve freely without binding. Install the cotter pin through the nut and shaft.

20. Recheck the bill hook pinion-to-cam gear clearances as outlined under "Checking the Knotter Stack," page 3 of this supplement, and adjust if required. When the knotter is properly assembled and adjusted, a combined clearance of 0.007" to 0.021" will exist between the bill hook pinions and cam gears.

21. Connect the needle yoke drive rod to the knotter cam arm.

22. If the twine finger activating lever assembly was removed during the knotter disassembly, install the assembly as follows:

    Series 532 Hay Balers: Install the assembly on the knotter housing side plates with two 3/8" – 16 x 1-1/4" carriage bolts, one .100" thick flat washer, and two 3/8" lock washers, spacers, and nuts. Be sure that the .100" thick flat washer is installed between the ***left-hand*** knotter side plate and the left-hand arm of the lever assembly. The lever assembly must swing freely without binding.

    Series 542 Heavy Duty Hay Balers: Install the assembly on the knotter housing side plates with two 3/8" – 16 x 1-1/4" carriage bolts, one .100" thick flat washer, and two 3/8" lock washers, spacers, and nuts. Be sure that the .100" thick flat washer is installed between the ***right-hand*** knotter side plate and the right-hand arm of the lever assembly. The lever assembly must swing freely without binding.

    IMPORTANT: *After installing the twine finger activating lever assembly on the knotter housing, adjust the twine fingers as outlined on page 29 of your operator's manual.*

23. After completing the knotter stackup procedure, check the needles for proper height, clearance to the twine disc and twine holder, and for proper timing to the plunger as outlined in your operator's manual.

SERIES 532 AND 542 HAY BALERS OPERATOR'S MANUAL SUPPLEMENT

GENERAL INFORMATION

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OPERATING TECHNIQUES – GROUND SPEED

The following information supplements the "Operating Techniques" information on page 10 of your operator's manual.

Ground speed is determined by the type of crop, size of the windrow, and the field surface. Suit the ground speed to baling conditions, establishing a forward rate of travel that will keep the baler at good capacity with the hay flowing steadily and evenly into the baler. Uniform feeding contributes greatly to square, well-formed bales. Normally, the baler should be run at a P.T.O. speed of 540 rpm. This will give a plunger speed of 90 strokes per minute. In some instances, however, depending on windrow size and the type of crop being baled, it may be advantageous to run the baler at a P.T.O. speed somewhat less than the recommended 540 rpm. When baling in light windrows, poorly shaped bales of non-uniform density can sometimes by improved by shifting to the next higher gear range to increase the ground speed, and reducing the throttle setting to decrease the P.T.O. speed and plunger speed.

When operating the baler in heavy windrows, decrease the forward speed of the baler by shifting to a lower gear range and maintain a P.T.O. speed of 540 rpm.

IMPORTANT: *Do not operate the baler at P.T.O. speeds in excess of 545 rpm.*

HAY DEFLECTORS

The following information relates to the hay deflectors provided with the baler and supersedes the information on the feed baffle contained on page 13 of your operator's manual.

Upon delivery of your baler, your Ford Tractor-Equipment Dealer provided you with three hay deflectors as standard equipment. The hay deflectors, Figure 1, should be installed in the feed housing when bale shape and density are not satisfactory, especially during light windrow conditions. The deflectors help to maintain the balanced flow feeding feature built into your Ford Baler, by enabling the feed forks to push the hay into the bale chamber at a more balanced rate to provide improved bale shape and uniformity of bale density.

The deflectors must be installed as a complete set, as shown in Figure 1. Install the upper deflector with the existing bolts at (1), and the two lower deflectors with the existing bolts at (2), and two 3/8" – 16 x 1" carriage bolts, flat washers, and nuts at (3).

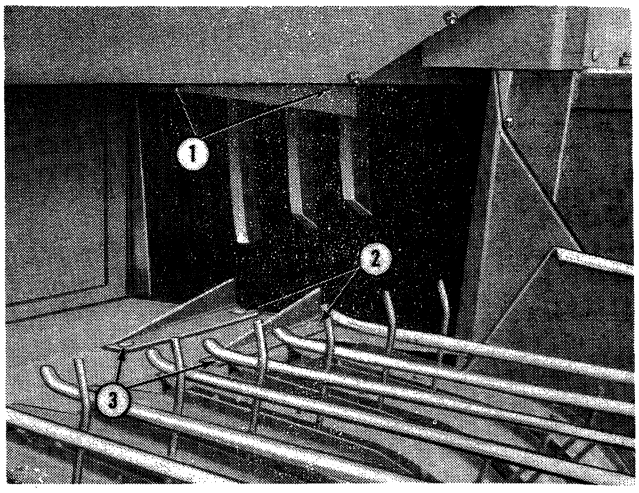


Figure 1
Hay Deflectors Installed

CONTENTS

SAFETY PRECAUTIONS

Most accidents that occur on the farm are the result of negligence and carelessness and are usually caused by the failure to follow simple rules and precautions. The following safety precautions are suggested to help prevent such accidents:

1. Do not permit anyone to ride on the hay baler.
2. Do not permit anyone to ride on the tractor with the operator.
3. Always shut off the engine before getting off the tractor.
4. The operator should never get off the tractor when the tractor is in motion.
5. Be sure that all safety shields are in place before operating the hay baler.
6. Inspect the bale chamber before operating to be sure there are no obstructions.
7. Keep all nuts, bolts, screws, and connections tight.
8. Avoid setting clutches so tight that they will fail to function when obstructions are encountered.
9. Always make sure the tractor engine is shut off and the P.T.O. drive disengaged before cleaning, adjusting, or lubricating P.T.O.-driven balers.
10. Never try to start the tractor engine while standing beside the tractor. Always start the engine while sitting in the tractor seat.
11. Use care when operating on steep grades to maintain proper stability.
12. Always drive the tractor at speeds compatible with safety, especially when operating over rough ground, near ditches, or turning.
13. Keep the tractor in gear when going downhill.
14. When operating P.T.O.-driven equipment, always shut off the engine and wait for the P.T.O. to stop before disconnecting the equipment.
15. Make sure the parking brake is "on" when the tractor is parked.
16. Never engage the parking brake when the tractor is moving.
17. Always keep the tractor brakes in proper operating condition.
18. Never run the tractor engine in a closed building without adequate ventilation, as fumes from the exhaust system are very dangerous.
19. Never install or remove a belt while the belt pulley is in motion.
20. Never wear loose clothing when operating the power take-off, or around equipment being driven by the P.T.O.
21. Always use the drawbar for pull-type work. Pulling from the upper link or rear axle is extremely dangerous.
22. If the tractor front end tends to raise, check for proper weight distribution.
23. Never leave equipment in the raised position.
24. If the tractor is stuck, always attempt to back out. If logs are used, always put them behind the rear wheels and back out.
25. Do not bypass the safety starter switch with "home made" wiring. Consult your Ford Tractor–Equipment Dealer if your safety starter controls are malfunctioning.
26. Keep the tractor engine clean to avoid the possibility of fire. Carry a fire extinguisher on the unit.
27. Keep the tractor keys where they are not available to children.

OPERATION

GENERAL HAYING INFORMATION

Your Ford Series 532 or 542 Heavy Duty Hay Baler, Figure 1, is a field tested machine designed to perform fast, dependable baling. In the baling operation, hay is carried by the pick-up and feed forks into the baling chamber where it is sliced, compressed, and tied by either twine or wire into bales from 12 to 52 inches in length with a 14" x 18" cross section. The bales are then pushed, under compression, out of the chamber onto the ground or up onto a wagon. Like all equipment of this type, efficient performance depends upon proper adjustment, maintenance, and operation. The operator, therefore, must become thoroughly familiar with the function of the various components of the machine and must know how to control and adjust them to obtain the desired results.

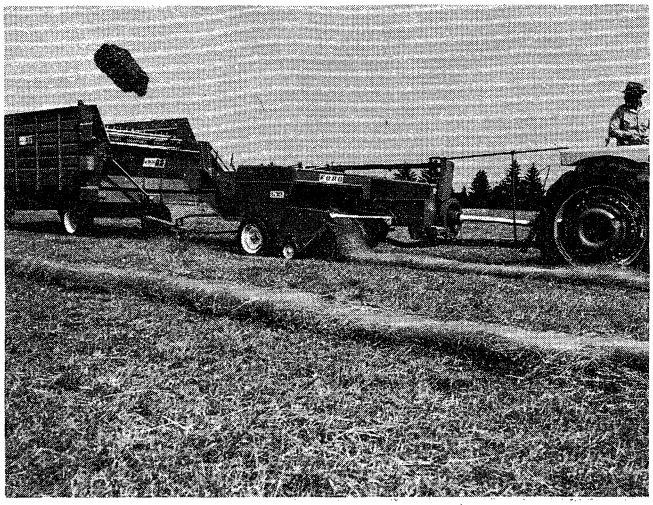


Figure 1
Series 542 Heavy Duty Hay Baler in Operation

The proper time to start haying operations is a matter requiring careful consideration. A year's hay crop can either be made or lost in a few days and the difference depends largely upon the timing of various haying operations and the manner in which they are performed. The proper time to start mowing hay will vary with local weather conditions and the particular type of crop which is being harvested. Hay conditioning is recommended after the hay has been mowed.

Figure 2
Ford Series 515 Mower and Series 510 Hay Conditioner in Operation

Figure 2 illustrates the Ford Series 515 Mower and the Series 510 Hay Conditioner in operation. The Ford Series 535 Mower-Conditioner, Figure 3, efficiently combines the tasks of cutting, conditioning, and placing the hay in fast drying windrows. The conditioner crimps the hay stems and allows them to dry in approximately the same interval as the leaves. Check the moisture of the hay carefully. It will reach a moisture content suitable for baling at least one day sooner than unconditioned hay. This over-all reduction in curing time will help minimize the loss from leaf shattering, nutrient bleaching by the sun, or other weather hazards such as wind and rain.

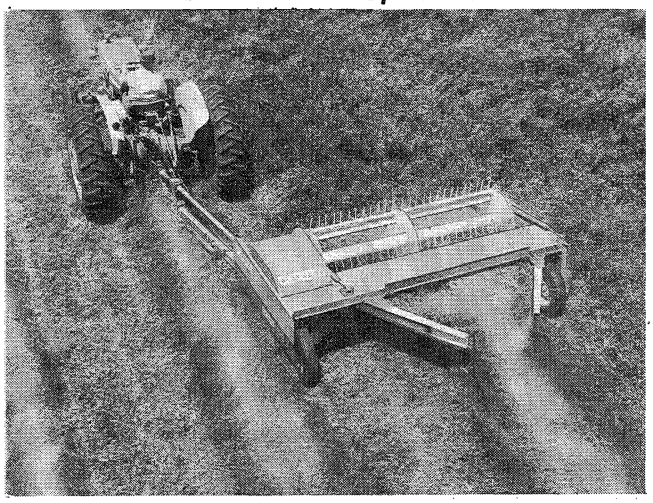


Figure 3
Ford Series 535 Mower-Conditioner

Raking, Figure 4, is also an important factor in harvesting and conserving a hay crop. Unless care is exercised in raking, many of the nutrient rich leaves will be lost. Raking should be done in the same direction in which the hay was mowed. This procedure will turn a greater portion of the leaves toward the center of the windrow and leave the stems exposed for faster drying. It is also important that raking be done when the moisture content of the mowed crop has been reduced to about 40% or when the crop is thoroughly wilted. If the hay is too dry, leaves may be lost in the process of raking.

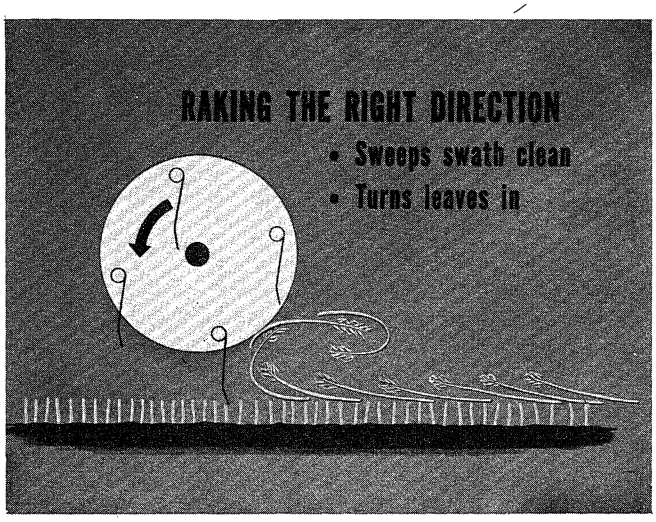


Figure 4
Raking Direction

It is especially important that the entire swath be raked and the hay be laid over on the stubble. This will provide better airing and will enable the baler to do a thorough job of picking up the hay. To facilitate the baling operation, windrows should be reasonably straight and as uniform in size as possible. See Figure 5. The windrow size may vary with the crop being raked and should be of a size that will enable the baler to be operated at near capacity. Uniform windrows are a great help toward trouble-free baler operation.

Figure 5
Making Windrows – Ford Series 503 Rake

When the hay crop is going to be mechanically dried, it should be raked, baled, and stored before it goes below 35% moisture. During storage it must then be dried to 15% moisture. If the hay is field cured, Figure 6, it is ready for baling between 20% and 15% moisture. This can be determined by taking a sample or hay from the center of a windrow and twisting it by hand. There should be no sign of moisture.

Hay that's cured just right provides more nutritious feed, and forms a bale that keeps well and holds its shape 'till feeding time.

IMPORTANT: *When the hay has over 20% moisture there is a danger of heating in storage which may cause fire. Moist hay will also lose feed value from oxidation and enzyme action.*

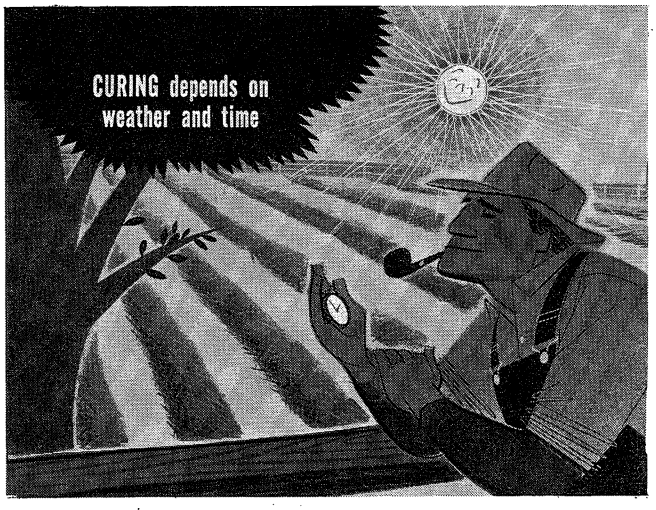


Figure 6
Proper Curing

ATTACHING THE HAY BALER

Ford Series 532 and Series 542 Heavy Duty Hay Balers are designed for use on all tractors having a P.T.O. and drawbar which meet A.S.A.E. standards. Tractors on which the location of the P.T.O. and drawbar differ from A.S.A.E. standards must be adapted so there is a distance of 14" between the end of the P.T.O. shaft and the center of the baler hitch, as shown in Figure 7.

When attaching the baler to Ford Tractors that are equipped with a swinging drawbar and 1-3/8" P.T.O. shaft, the drawbar should be in the 14" position. If the tractor is equipped with an offset drawbar, the offset should be in the down position as shown in the Insert, Figure 7. Secure the tractor drawbar in the center position.

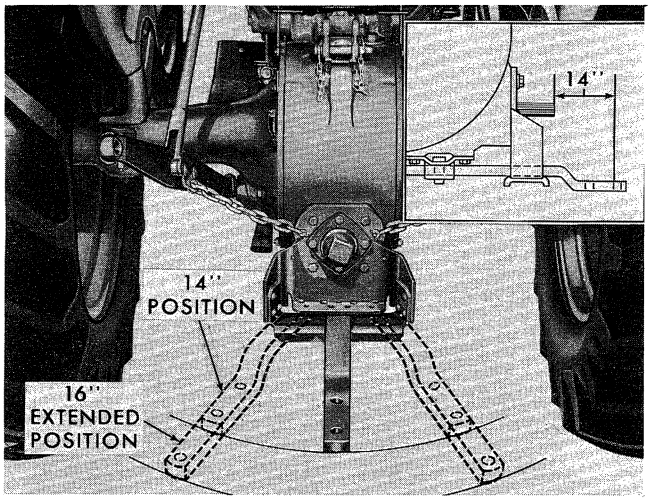


Figure 7
Swinging Drawbar Position

To attach the baler to the tractor, disengage the tractor P.T.O. and back the tractor into position in front of the baler. Shut off the tractor engine. Secure the tongue to the drawbar with a lock pin or bolt and nut, as shown in Figure 8. The baler should be attached to the tractor so the bale chamber is level with the ground and the baler P.T.O. drive line is as level with the P.T.O. shaft as possible. If your baler is equipped with the hitch shown in Figure 8, it can be leveled four different ways; by turning the hitch over on top of the tongue so the flat side is up or down, or by moving the hitch to the bottom of the tongue so the flat side is up or down.

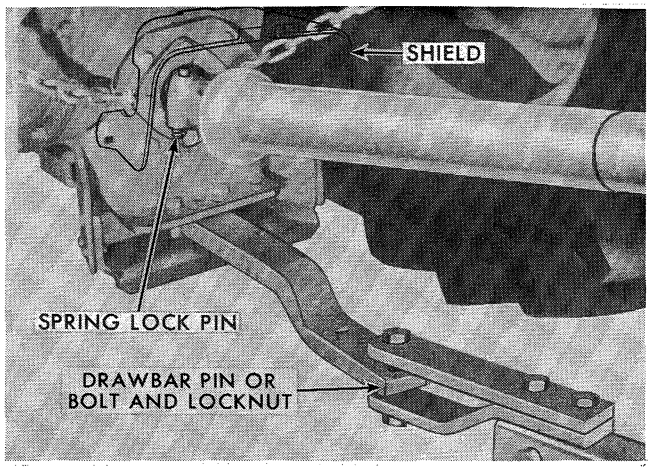


Figure 8
Attaching the Baler

Your baler is equipped with the hitch shown in Figure 9, it can be leveled eight different ways; by moving the hitch up or down, by turning the hitch over and moving it up or down, or by reversing the hitch support plates so they angle upward.

P.T.O. Drive: Depress the spring-loaded lock pin, shown in Figure 10, and slide the universal joint on the tractor P.T.O. shaft until the pin locks in the groove of the shaft.

IMPORTANT: *Do not use a hammer to drive the universal joint onto the tractor P.T.O. shaft.*

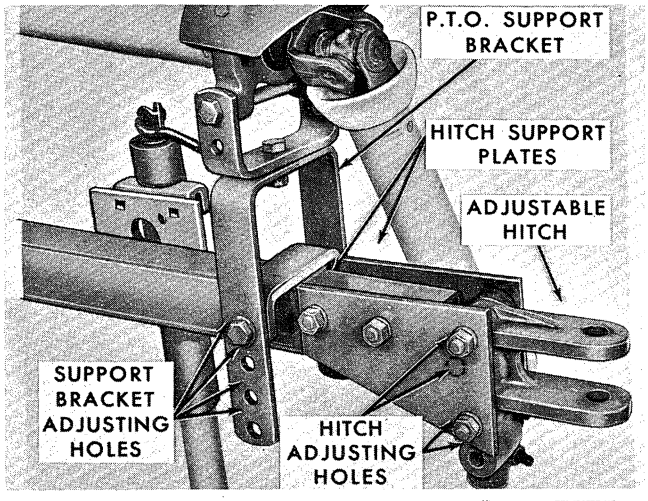


Figure 9
Adjustable Hitch and P.T.O. Support Bracket

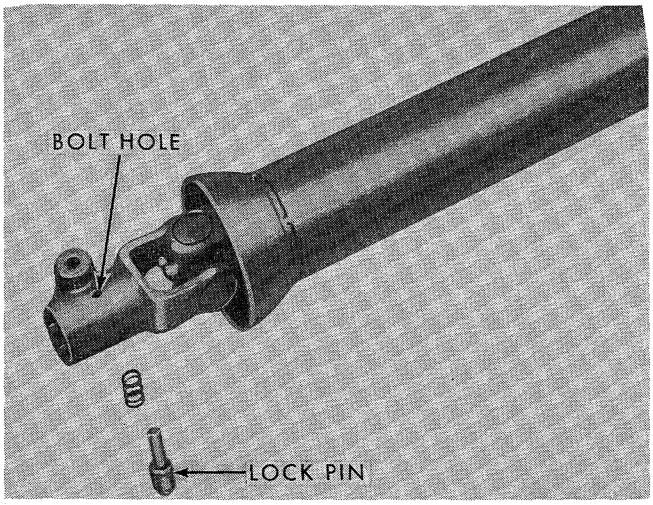


Figure 10
Universal Joint Bolt Hole

If the tractor P.T.O. shaft is not grooved to accommodate the lock pin, secure the universal joint by inserting a 5/16" x 2-1/2" machine bolt through the shaft and installing a lock washer and nut.

NOTE: *It is recommended that a tractor P.T.O. shield be used. See the black outline in Figure 8.*

On balers equipped with a three-joint P.T.O. drive, adjust the P.T.O. support bracket, Figure 9, up or down so that the P.T.O. drive line is as level with the tractor P.T.O. as possible. The bracket may be adjusted by repositioning the two bracket mounting bolts in any of the four adjusting holes.

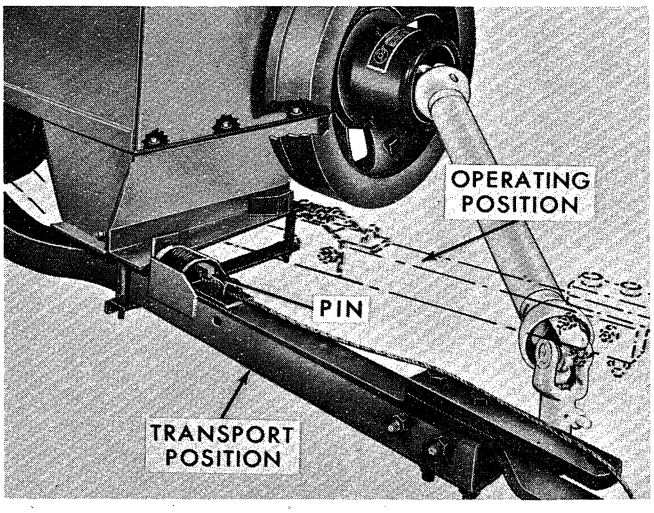


Figure 11
Baler Equipped with Manual Tongue Swing

TRANSPORTING THE HAY BALER

When the baler is to be transported, the baler tongue may be set in the right position, Figure 11, to reduce the baler transport width. However, for field operations, the tongue must be set in the left position. It is not necessary to dismount the tractor to change to either the transport or operating positions.

If your baler is equipped with a manual tongue swing, Figure 11, pull the spring-loaded tongue retaining pin with the attached rope while carefully backing the tractor to the right. Release the rope when the tongue begins to swing, allowing the pin to lock the tongue in the transport position. Repeat this procedure while backing the tractor to the left to change from the transport to the operating position.

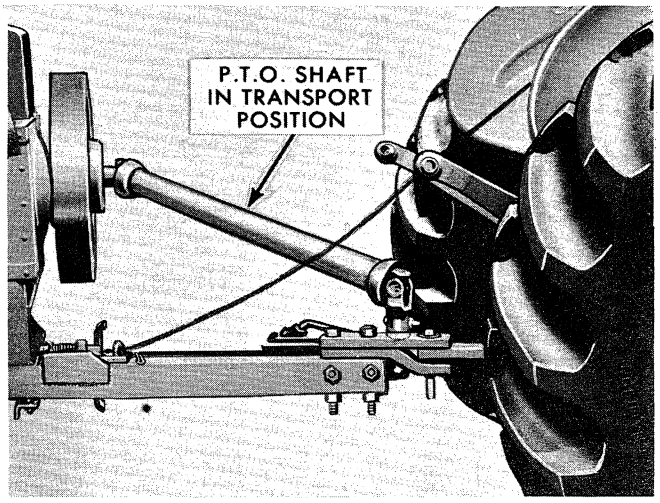


Figure 12
P.T.O. Installed

IMPORTANT: *On balers equipped with a two-joint P.T.O. drive shaft, the P.T.O. shaft should be disconnected and placed in the transport position, Figure 12, when the baler tongue is placed in its transport position. This will permit sharper left turns during transport and will reduce the possibility of the left rear tractor tire rubbing against the P.T.O. shaft.*

CAUTION: ***Do not attempt to shift the baler tongue when the two-joint P.T.O. drive shaft is disconnected and placed in the transport position.*** *Disconnect the two-joint P.T.O. drive shaft from its transport position, Figure 12, and connect it to the tractor P.T.O. shaft prior to shifting the baler tongue.*

BALER JACK

To use the jack, pull the spring-loaded locking pin, Figure 13, and pivot the jack downward until it locks in the down position. Raise or lower the height of the baler by rotating the jack handle.

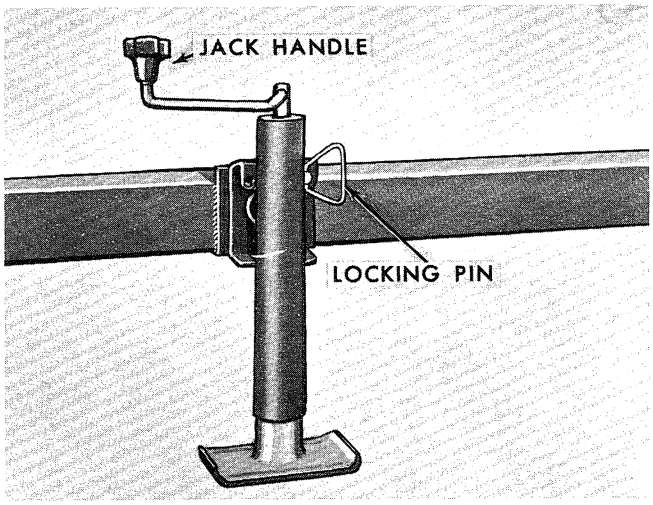


Figure 13
Baler Jack

OPERATING TECHNIQUES

Like the rake, the baler should follow the direction of mower travel. This approach will allow the pick-up teeth to get under the bottom of the windrow and pick the stubble clean.

To obtain the best feeding action, the baler should be centered on the windrow. An off-center approach may cause the hay to be lost over the side of the pick-up.

Figure 14
Baler Direction

Ground speed is determined by the type of crop, size of the windrow, and the field surface. Suit the ground speed to baling condtions, establishing a forward rate of travel that will keep the baler at good capacity with the hay flowing steadily and evenly into the baler. Uniform feeding contributes greatly to square, well-formed bales. Normally, the baler should be run at a P.T.O. speed of 540 rpm. This will give a plunger speed of 90 strokes per minute. In some instances, however, depending on windrow size and the type of crop being baled, it may be advantageous to run the baler at a P.T.O. speed somewhat less than the recommended 540 rpm. When baling in light windrows, poorly shaped bales of non-uniform density can sometimes be improved by shifting to the next higher gear range to increase the ground speed, and reducing the throttle setting to decrease the P.T.O. speed and plunger speed.

Figure 15
Center the Pick-Up

Figure 16
Ground Speed

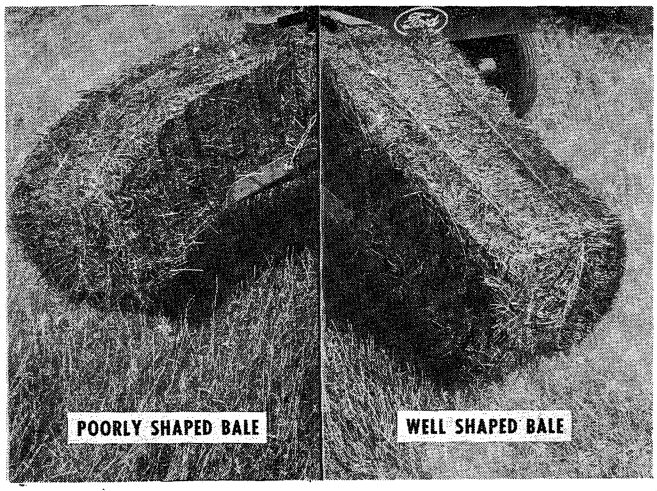


Figure 17
Importance of Adjustment

When operating the baler in heavy windrows, decrease for forward speed of the baler by shifting to a lower gear range and maintain a P.T.O. speed of 540 rpm.

IMPORTANT: *Do not operate the baler at P.T.O. speeds in excess of 545 rpm.*

Keep the bale size down to 60 pounds (36") or less for easier handling. Keep the bales dense and well shaped so that several layers can be stacked without collapsing. If a sudden shower starts before all the bales are under cover, let them lie wide side up.

Length	28"	32"	36"	40"
Weight – Hay	44 lbs.	52 lbs.	60 lbs.	66 lbs.
Weight – Straw	34 lbs.	40 lbs.	45 lbs.	50 lbs.

Better hay baling depends upon proper overall baler adjustment. When properly adjusted, the baler will form well-shaped bales that store easily with uniform bale slices for convenient feeding.

ADJUSTMENTS

PICK-UP HEIGHT

The pick-up adjusting rod, Figure 18, is used to vary the height of the pick-up teeth. If your baler is equipped with a manual tongue swing, the rod should be positioned in the top hole of the adjusting rod bracket when transporting the baler. When operating the baler, position the pick-up assembly so that the pick-up teeth will work below the top of the stubble without striking the ground. Always secure the adjusting rod in position with the self-locking pin.

During baler operation, the pick-up reel height may be hydraulically adjusted up or down by "feathering" the tractor remote control valve handle. This is especially helpful when the baler is being used in rough terrain or when an obstruction is encountered in the field.

NOTE: *If the tractor remote control valve contains detents, it may be desirable to make the detents inoperative by removing the detent springs. With the detent springs removed, the remote cylinder will stop its movement when the handle is released. For further information see your local Ford Tractor–Equipment Dealer.*

IMPORTANT: *When transporting the baler for long distances or over rough terrain, position the pick-up adjusting rod, Figure 18, in its uppermost position to prevent any unnecessary strain on the pick-up assembly.*

PICK-UP COUNTERBALANCE SPRINGS

The pick-up counterbalance springs, Figure 19, carry most of the weight of the pick-up assembly providing a floating action. The tension on the counterbalance springs control this action. Normally, the springs are adjusted so that the pick-up assembly will float with approximately 20–35 pounds weight at the hay hold-down pipe, Figure 20, when the pick-up is in the operating position. However, it may be necessary to increase or decrease the tension on the counterbalance springs, depending on crop conditions.

The tension is adjusted by loosening the jam nuts and turning the adjusting nuts, (1) and (2), Figure 19. Always secure the adjusting nuts in place with the jam nuts.

HAY HOLD-DOWN ASSEMBLY

The hay hold-down assembly, Figure 20, holds the material being fed into the baler firmly on the pick-up teeth for a positive feeding action. If your baler is equipped with a 6-bar pick-up reel, the tension on the hold-down assembly is controlled by a torsion spring. On balers equipped with a 4-bar pick-up reel, the tension is controlled by a coil spring as shown in the Insert, Figure 20.

Normally, the torsion spring on the 6-bar pick-up reel should apply approximately 10 pounds of down pressure on the hay hold-down pipe, measured at a distance of 12 inches from the pipe pivot point. Depending on the type and density of the material being baled, however, it may be desirable to increase or decrease the pressure on the hay hold-down pipe. To increase or decrease the pressure, remove the cotter pin from the adjusting nut. Rotate the nut in the desired direction and install the cotter pin through the nut and pipe.

The hay hold-down pipe stops, Insert, Figure 20, on both the 4-bar and 6-bar pick-up reels, limit the upward and downward travel of the hay hold-down tines. The travel may be adjusted by backing off the jam nuts, loosening the stop bolts, and repositioning the bolts in the slot of the stop plate.

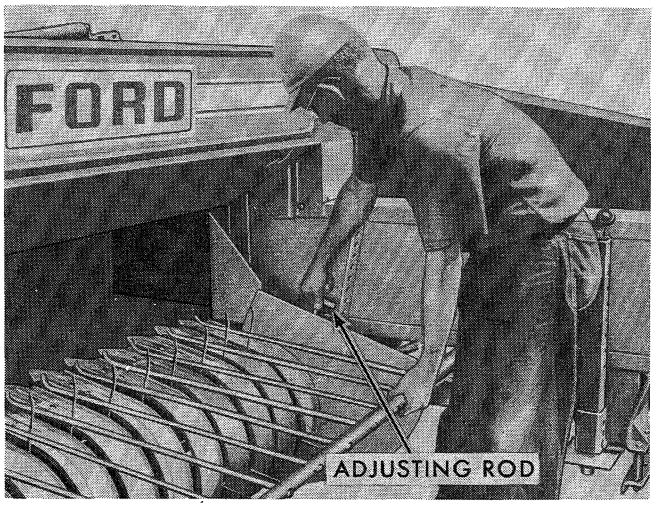


Figure 18
Adjusting the Pick-Up Height

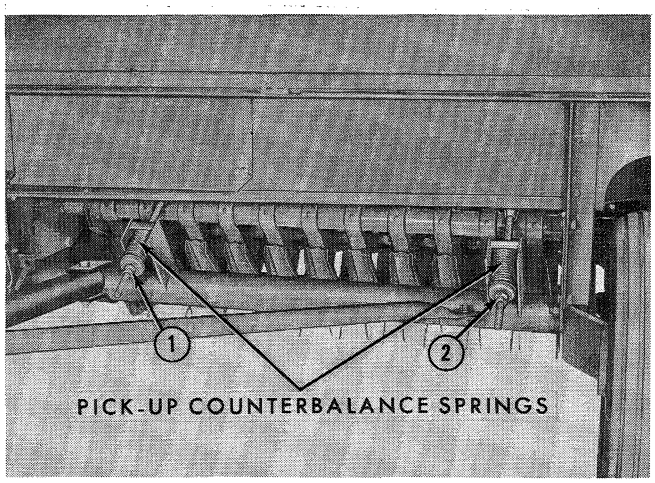


Figure 19
Pick-Up Counterbalance Springs

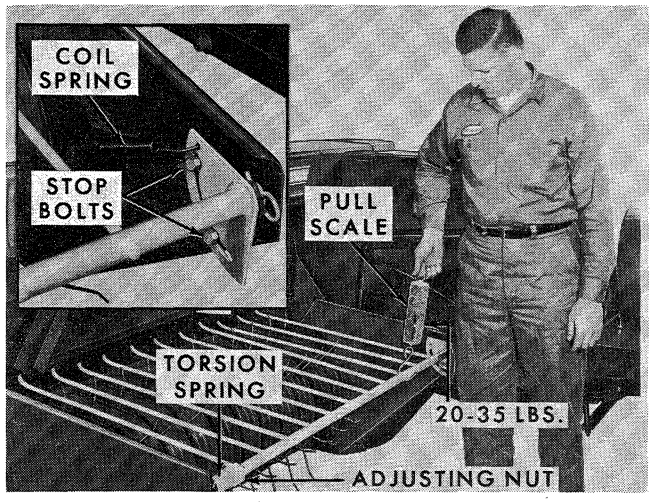


Figure 20
Hay Hold-Down and Pick-Up Spring Adjustment

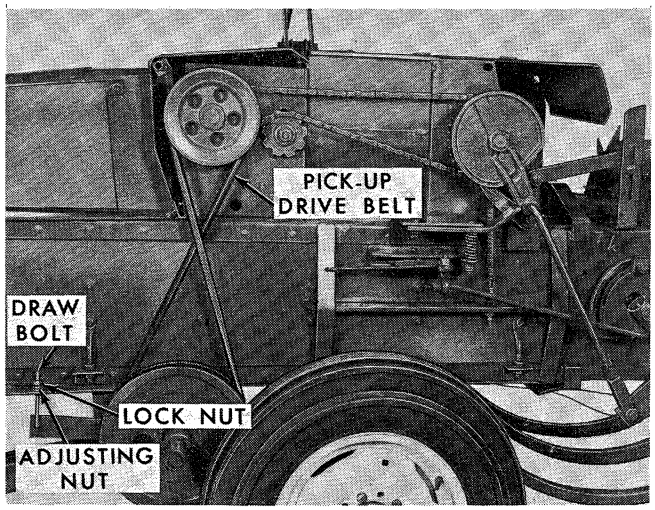


Figure 21
Pick-Up Drive Belt

PICK-UP DRIVE BELT

The pick-up drive belt should be adjusted tight enough to drive under normal loads yet to allow slippage if obstacles are encountered. Strike the belt with your hand for an indication of tension. When properly adjusted, the belt should feel "alive" and "springy". The belt is adjusted by means of the adjusting nut and draw bolt, shown in Figure 21.

BALE TENSION

The Ford Hay Baler is equipped with spring-loaded bale tension bars (2), Figures 22 and 23, to control the density of the material in the bale, and consequently, the bale weight. Different crops and varying moisture content may make it necessary to use more or less tension. Generally, coarse or green material will require less tension, while dry or light material requires more tension.

Check bale density regularly during operation. Excessive density may result in twine breakage. The density of bales is controlled by adjusting the bale tension bar handles (1), Figures 22 and 23, When adjusting the bale tension, always adjust each handle the same number of turns.

BALE WEDGES, FEED BAFFLE AND HAY DEFLECTOR

Upon delivery of your baler, your Ford Tractor—Equipment Dealer provided you with one pair of bale wedges, a feed baffle and three hay deflectors as standard equipment. The bale wedges may be necessary to obtain desired bale density in dry, slippery or short crop conditions. As many as three pair of bale wedges may be installed in the bale chamber. Holes are provided in the rear of the bale chamber, Figures 22

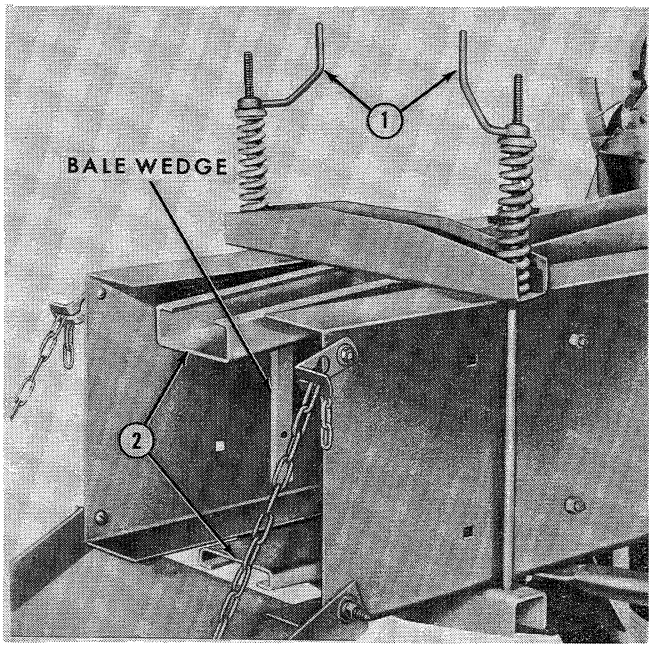


Figure 22
Series 532 Bale Tension Adjustment

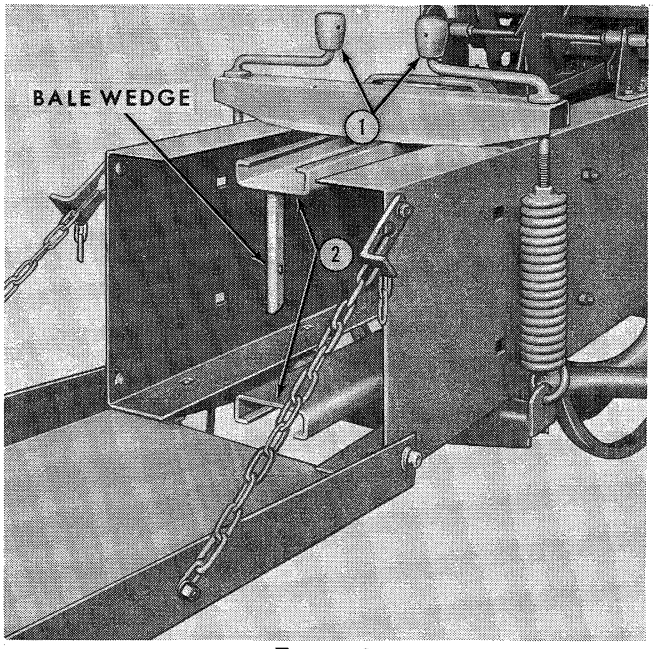


Figure 23
Series 542 Bale Tension Adjustment

and 23, for installation purposes; however, the wedges should not be installed until the bale chamber has become polished through actual baler operation. When the wedges are installed, the inclined plane of the wedge should point toward the front of the baler with each wedge directly opposite the other. Figure 23 shows the bale wedges installed. Additional bale wedges are available as optional equipment from your Ford Tractor—Equipment Dealer. If the optional bale wedges are to be installed, one pair of wedges should be installed toward the rear of the bale chamber where holes are provided to accommodate the wedges, and two cast bale retarders may be installed on the upper and lower tension channels. When baling gummy or sticky material. it may be necessary to remove all wedges from the rear of the bale chamber.

The feed baffle, Figure 24, should be installed in the feed house opening when the baler is used in light crop conditions and bale shape and density are not satisfactory. The baffle reduces the size of the feed opening, enabling the feed forks to push the hay into the bale chamber at a balanced rate to obtain better shaped bales with increased density. The baffle is installed on the bale chamber brace with the two existing lock washers and nuts as shown.

The hay deflectors, Figure 25, should be installed in the feed housing when bale shape and density are not satisfactory, especially during light windrow conditions. The deflectors help to maintain the balanced flow feeding feature built into your Ford Baler, by enabling the feed forks to push the hay into the bale chamber at a more balanced rate to provide improved bale shape and uniformity of bale density.

FEED PLATFORM ACCESS DOOR

The feed platform access door, Figure 26, provides an additional means to vary the size of the feed house opening when the baler is used in light crop conditions. In addition, the door provides a convenient access to the feed platform area when it may be necessary to remove the baler knives for sharpening or remove material from the bale chamber.

CAUTION: *Do not attempt to perform work or remove material from the feed platform area when the baler is running.*

When the baler is used in light crop conditions, position the door forward as required to reduce the size of the feed opening. During normal crop conditions, the door should be positioned rearward as shown in Figure 26. Adjust the door as follows:

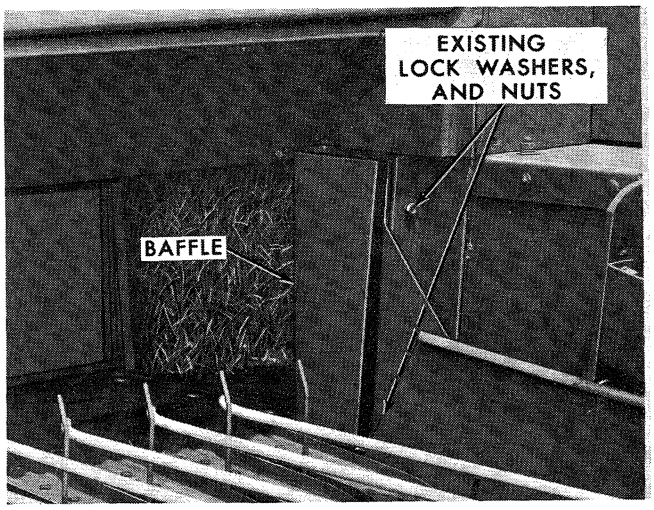


Figure 24
Feed Baffle Installed

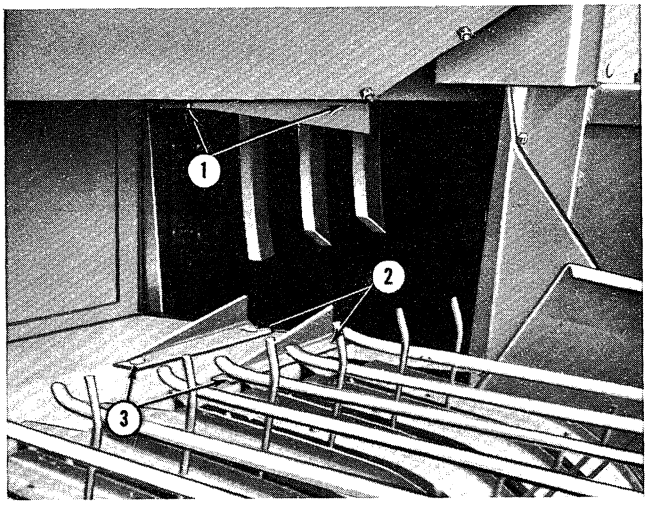


Figure 25
Hay Deflectors Installed

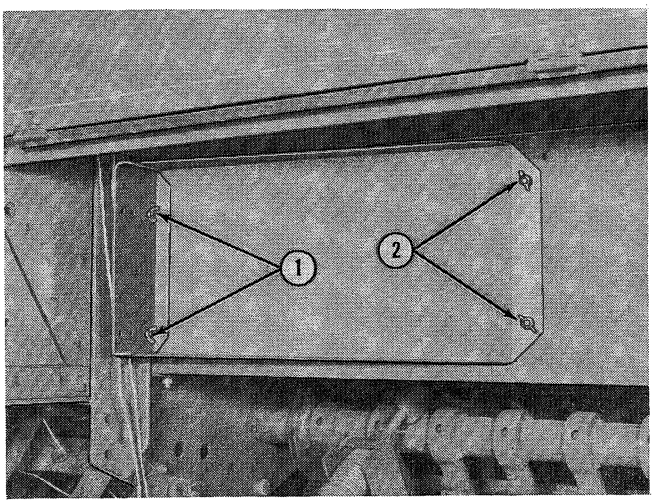


Figure 26
Feed Platform Access Door Location

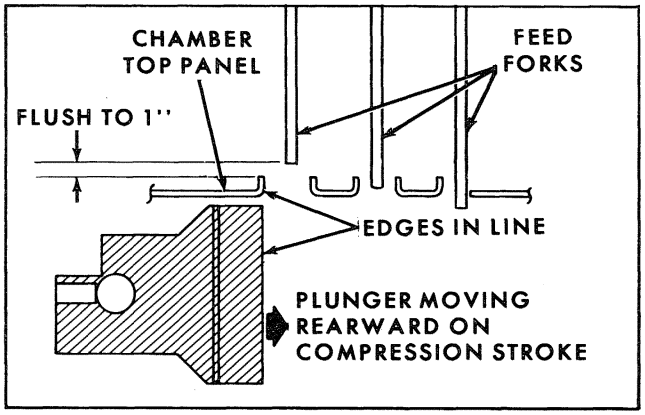


Figure 27
Timing Inner Feed Fork

1. Remove the bolts, lock washers and wing nuts at (1), Figure 26.

2. Loosen the wing nuts at (2) and adjust the door forward or rearward as required.

3. Install the bolts, lock washers, and wing nuts at (1), and tighten the wing nuts at (2).

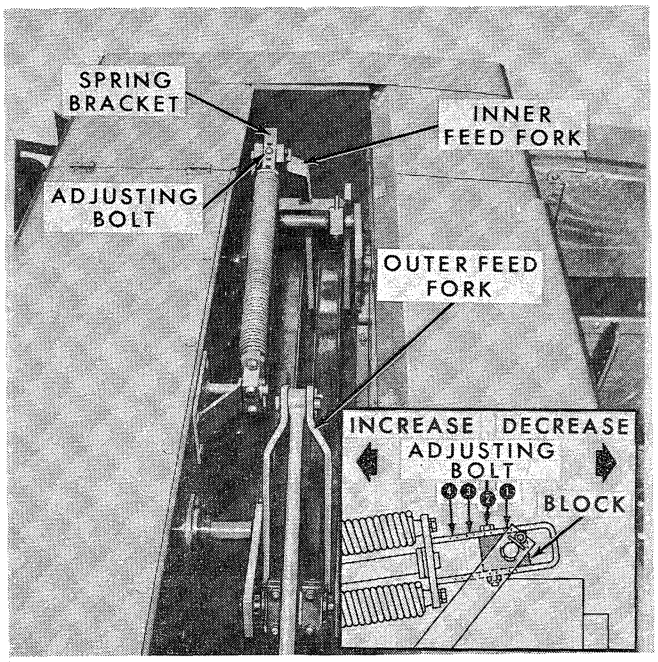


Figure 28
Inner Feed Fork Adjustment

NOTE: *If bale shape and density are not satisfactory when the feed platform access door is positioned forward as far as possible during light crop conditions, it may be necessary to install the feed baffle as shown in Figure 24.*

TIMING INNER FEED FORK

The inner feed fork must be properly timed with the plunger. This is necessary so that material will be fed uniformly into the bale chamber and to prevent the plunger from striking the inner feed fork. To check the timing, rotate the flywheel and position the plunger on the rearward stroke so that the projections on the plunger face align with the vertical flange of the feed fork stripper slot. At this point, the tip of the feed fork tines should be positioned flush to 1" above the vertical flange as shown in Figure 27, with the adjusting bolt in the second hole from the left, as shown in Figure 28, If adjustment is required, proceed as follows:

1. Loosen the main drive chain tightener (2), Figure 32.

2. Remove the master link from the main drive chain.

3. Position the plunger on the rearward stroke so that the projections on the plunger face align with the vertical flange of the feed fork stripper slot.

4. Position the feed fork tines flush to 1" above the vertical flange of the feed fork stripper slot, with the adjusting bolt in the second hole from the left, the curved end of the block facing left, and the connector pin positioned in the middle hole of the feed fork as shown in Figure 28. Failure to do so will result in incorrect feed fork timing.

5. Install the main drive chain on the top of the sprockets so that the top span is tight. Be certain the distance between the tip of the feed fork tine and the vertical flange of the feed fork stripper slot does not exceed 1".

6. Install the master link in the main drive chain and tighten the chain with the chain tightener.

NOTE: *After adjusting the inner feed fork timing, it is necessary to check the needles for proper timing.*

TIMING OUTER FEED FORK

To obtain the balanced flow feeding feature that is designed into the Ford Baler, the outer feed fork must be properly timed with respect to the inner feed fork. Proper timing exists when the two feed forks are 180° opposite each other, i.e., when one crank is up the other must be down, or when there are 29 chain pitches between the holes in the two sprockets. See Figures 28 and 29. If the timing requires adjustment, proceed as follows:

1. Loosen the feed fork drive chain tightener, Figure 29.
2. Remove the master link from the outer feed fork drive chain.
3. Position the outer feed fork crank 180° opposite the inner feed fork crank.
4. Install the outer feed fork drive chain, keeping the bottom strand taut with 29 chain pitches between the timing holes.
5. Install the master link in the chain and tighten the chain.

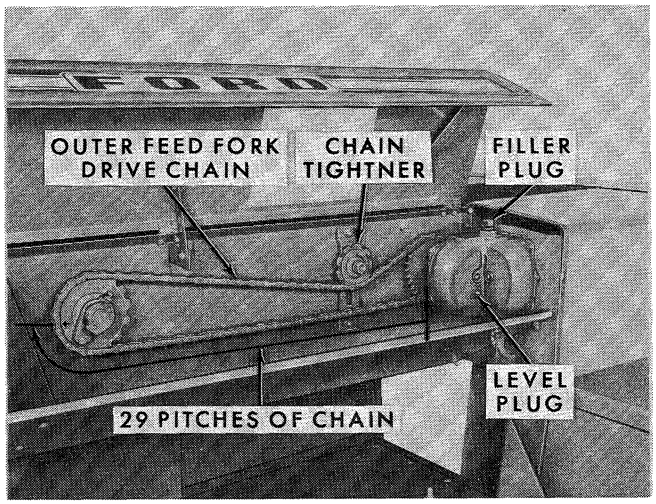


Figure 29
Outer Feed Fork Adjustment

FEED FORKS

Density across the bale is regulated by the volume of hay being fee into the baler, proper adjustment of the feed platform access door, installation of the feed baffle, and the depth the inner feed fork penetrates into the bale chamber.

If the bales are curved to the left as they come out of the bale chamber, they are not dense enough on the left side. To correct this condition, more hay must be pushed further across the bale chamber. This can be accomplished by increasing the ground speed and/or windrow size. If this does not correct the condition, the inner feed fork penetration should be increased, and, if necessary, the feed baffle installed and/or the feed platform access door moved forward.

The inner feed fork penetration will increase progressively as the following adjustments are performed in the order listed below.

1. Reposition the adjusting bolt, Figure 28, in the next hole, (3) or (4), to the right (facing direction of baler travel).
2. Remove the connector pin, turn the bearing block end-for-end so that the curved end is to the right, and insert the adjusting bolt in hole (3).
3. Remove the connector pin, reposition the spring bracket downward, and install the connector pin in the lower hole of the feed fork.

NOTE: *Maximum inner feed fork penetration will be obtained with the adjusting bolt inserted in hole (3) of the spring bracket, with the bearing block turned so that the curved end is to the right, and the connector pin positioned in the bottom hole of the feed fork.*

NOTE: *A stop lug located near the bottom hole of the feed fork prevents installing the connector pin in the lower hole of the feed fork when the curved end of the bearing block is facing left.*

Conversely, if the bales are curved to the right as they come out of the bale chamber, they are not dense enough on the right side. This condition may be corrected by reducing the ground speed and/or windrow size. If this does not correct the condition, the inner feed fork penetration should be decreased, and, if necessary, the feed platform access door moved rearward, and/or the feed baffle removed from the feed house opening.

The inner feed fork penetration will decrease progressively as the following adjustments are performed in the order listed below.

1. Reposition the adjusting bolt, Figure 28, in the next hole (1) to the left, with the curved end of the bearing clock facing left (facing direction of baler travel).

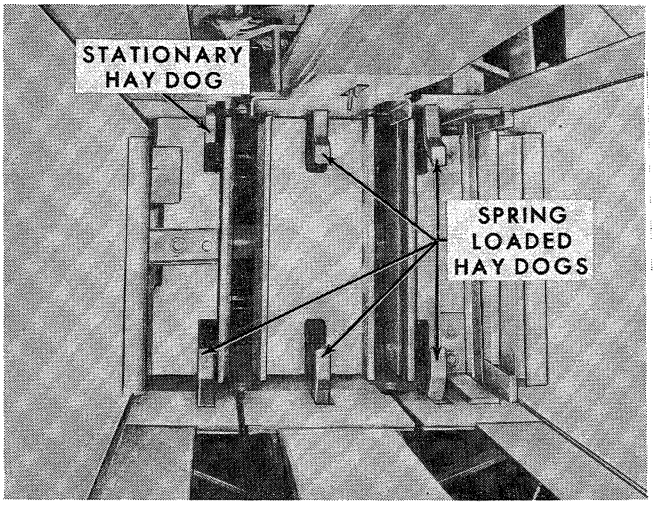


Figure 30
Hay Dog Location

2. Remove the connector pin, reposition the spring bracket upward, and install the connector pin in the upper hole of the feed fork. Then reposition the adjusting bolt in hole (2), or for even less penetration, hole (1).

NOTE: *Minimum inner feed fork penetration will be obtained with the adjusting bolt inserted in hole (1) of the spring bracket, with the bearing block turned so that the curved end is to the left, and the connector pin positioned in the top hole of the feed fork.*

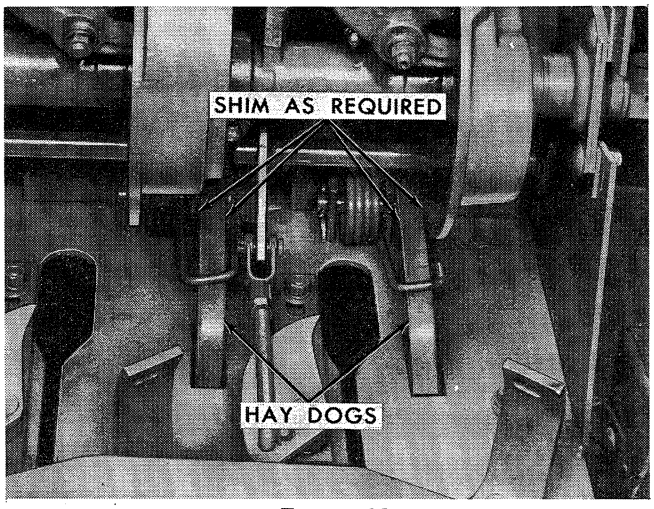


Figure 31
Hay Dog Adjustment

The inner feed fork is spring loaded to provide protection against overloading. **If the feed fork connecting rod begins to telescope and knock, decrease the volume of material being fed into the baler.**

NOTE: *It is not necessary to retime the inner feed fork to the plunger after the inner feed fork penetration has been adjusted.*

HAY DOGS

As each charge of hay is compressed in the chamber by the plunger, five spring loaded hay dogs, Figure 33, in the top and bottom of the bale chamber are forced out of the chamber by the hay. As the plunger starts its return stroke, the hay dogs should quickly "snap" back into the chamber to hold the charge of hay in compression. A sixth stationary hay dog, located on the top inside bale chamber, helps hold the hay for firm, even bales.

Tension on the hay dogs is provided by two springs located on top of the bale chamber, Figure 31, and three springs located under the bale chamber. The action of the spring loaded hay dogs should be individually checked periodically to make sure that they rebound to the home position. Check the springs to make sure they have not lost their tension, are not broken, and are properly seated on the hay dogs. The hay dogs should also be checked to make sure that they clear the access slots in the face of the plunger without rubbing. If necessary, add shims, Figure 31, to either side of the hay dog as required to maintain the proper plunger clearance.

ADJUSTING DRIVE CHAINS

The main drive chain, knotter drive chain, and feed fork drive, shown in Figure 32, must be kept in proper adjustment to obtain long chain life and trouble-free operation. The chains should be adjusted to allow a slight flexing in the slack strand. A tight chain imposes too much strain on the working parts, causing premature wear. An excessively loose chain will cause vibration, noise, and possible jumping. Each chain is adjusted with a chain tightener located at (1), (2), and (3), Figure 32.

When adjusting the drive chains, rotate the sprockets until the chain is at its tightest point, then adjust the tightener to obtain a slight flexing of the slack strand.

ADJUSTMENTS

FRICTION CLUTCH

The balers are equipped with slip clutches and/or a combination of slip and overrunning clutches to protect both the tractor and baler from damage. The slip feature of the clutch protects the baler from shock loads resulting from excessively heavy charges and obstacles lodging between the knives. The overrunning feature of the clutch allows the baler flywheel to overrun when the tractor power is disengaged, protecting the P.T.O. shaft and tractor from strain.

IMPORTANT: *During short storage periods between crops and at the end of each season, the pressure on the clutch disc should always be relieved as described in the section on STORAGE, to prevent the clutch discs from adhering to the flywheel.*

When the baler is removed from storage, rotate the flywheel by hand to make certain that the clutch discs have not adhered, then burnish and adjust the clutch as follows:

1. Adjust the three set screws (1), Figure 33, so that there is a slight drag on the clutch but it is still permitted to slip. Rotate the flywheel by hand to make certain the clutch plates have separated.

   NOTE: *On engine driven balers, three hex head bolts replace the set screws.*

2. Back off the nuts (2), to release the tension on the leaf springs.

3. Using the tractor P.T.O., rotate the flywheel several revolutions with the clutch slipping. As soon as the clutch is burnished, (brown and polished), disengage the tractor P.T.O. being sure to stop the tractor engine, or stop the baler engine.

4. Back off the three set screws (three hex head bolts on engine driven balers) and secure the screws in the out position with the hex locking nuts.

5. Adjust the clutch by tightening the six nuts (2), until the gauge washers contact the clutch face. Back off the nuts until the gauge washers can be turned by hand. Maximum washer end play must not exceed 0.010".

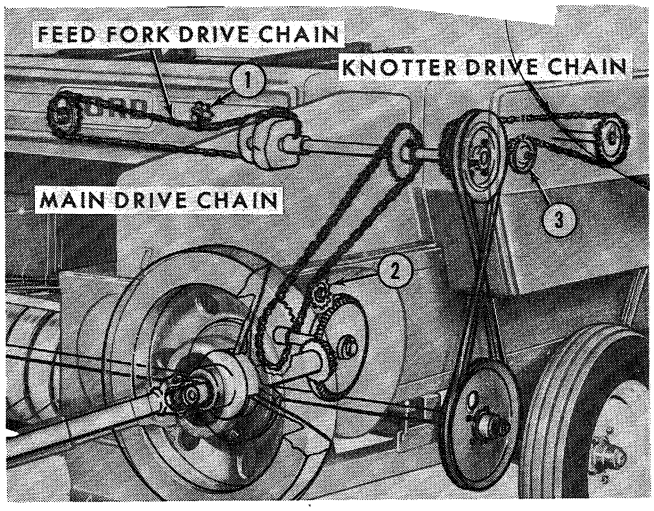


Figure 32
Drive Chain Adjustment

CLUTCH BELLCRANK

The hex head bolt in the end of the bellcrank, Figure 34, should be adjusted to provide a 1/16" clearance between the bolt head and the clutch pawl, when the clutch arm is seated against the rebound dog and the pawl roller is held against the clutch hub.

Adjust the hex head bolt (1), Figure 34, as follows:

1. Seat the clutch arm against the rebound dog, as shown in Figure 34.

2. With the pawl roller held against the clutch cam hub, adjust the hex head bolt in the bellcrank to provide a 1/16" clearance between the bolt head and the pawl. Secure the bolt with the jam nut.

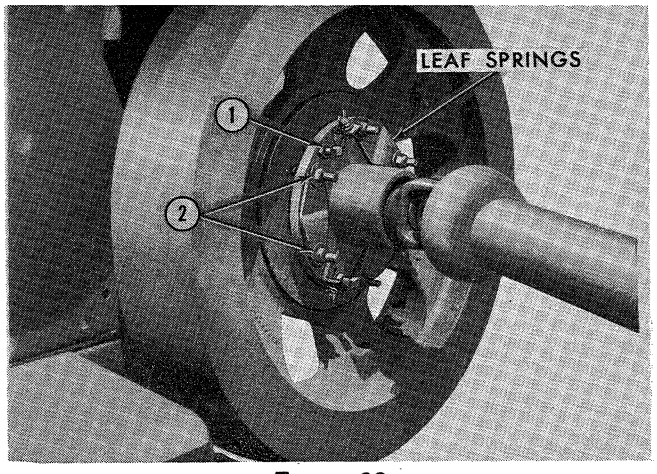


Figure 33
Friction Clutch

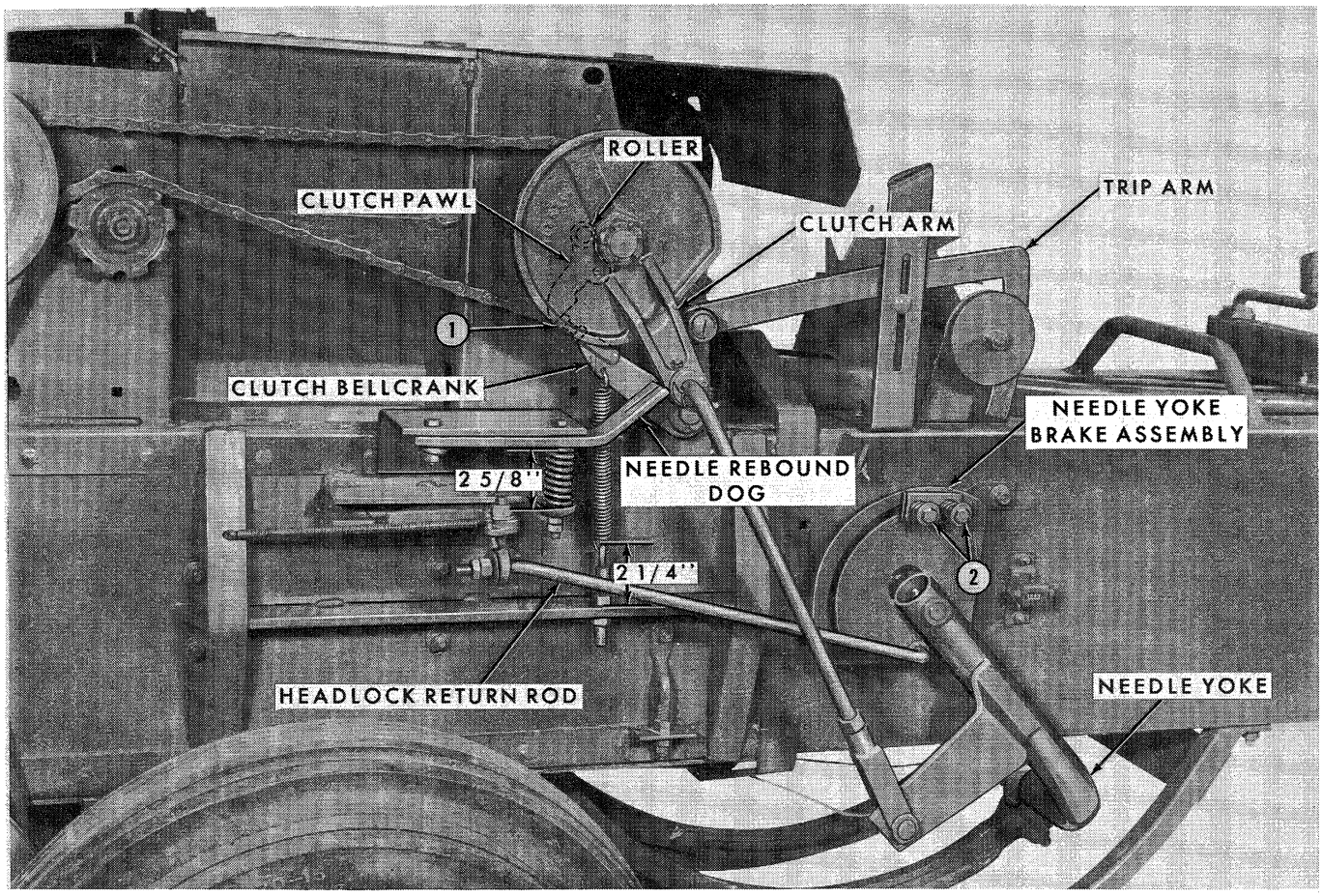


Figure 34
Clutch Bellcrank

Proper spring tension on the bellcrank must be maintained. Adjust the bellcrank spring eyebolt to a length of 2-1/4" from the top of the eyebolt to the top surface of the rib on the side of the chamber.

NEEDLE REBOUND DOG

The rebound dog, Figure 34, must be adjusted to retain the clutch arm and prevent any forward motion of the needles while they are in the home position. For proper tension on the needle rebound dog, adjust the spring to a length of 2-5/8" with the clutch arm seated against the rebound dog as shown.

NEEDLE YOKE BRAKE

The needle yoke brake assembly, shown in Figure 34, maintains a constant load on the needle yoke arm during the tying cycle. This prevents the needles from overrunning the drive and also helps hold the needles in the home position. The brake springs should be adjusted to 7/8" – 15/16" in length. The adjustment can be made by means of the two hex head bolts (2), Figure 34.

BALE LENGTH

The bale length can be adjusted from 12" to 52" by changing the position of the stop bolt (3), Figure 35, in the support bracket. To change the bale length, reposition the stop bolt lower for longer bales and higher for shorter bales.

METERING WHEEL

Slotted holes are provided in the metering wheel bearing brackets (5), Figure 34, for obtaining proper

relationship between the knotter clutch pawl, Figure 34, and the tying mechanism trip arm assembly.

To adjust:

1. Turn the flywheel counterclockwise until the needle yoke is in the home position, Figure 34.
2. Adjust the metering wheel bearing brackets (5), Figure 35, until full contact is made between the clutch bellcrank bolt head (1), Figure 34, and the clutch pawl.
3. Trip the tying mechanism by rotating the metering wheel in the direction of bale travel.
4. Turn the flywheel counterclockwise until the clutch trip arm (2), Figure 35, has moved to its rearmost position. The clutch trip arm should drop freely past the serrated roller (4).
5. Adjust the trip arm support bracket (1), Figure 35, to provide a slight clearance between the support bracket and trip arm (2).

PLUNGER HEADLOCK

When the needles move to their uppermost position, the headlock return rod, Figure 36, permits the spring loaded headlock to rotate into the slot in the side of the bale chamber. The headlock acts as a plunger safety stop to prevent the plunger from striking the needles when the baler is out of time. As the needle yoke returns to the home position as shown in Figure 34, the headlock return rod rotates the headlock out of the bale chamber and positions it parallel to the side of the bale chamber as shown in Figure 36.

Adjust the plunger headlock as follows:

1. Turn the flywheel counterclockwise until the needle yoke is in the home position, Figure 36.
2. Adjust the length of the headlock return rod, Figure 36, by backing off the lock nut, and turning the adjusting nut, as required, until the inner surface of the headlock is parallel to the side of the bale chamber. Tighten the lock nut.
3. Adjust the eyebolt so that it is free to swivel when the headlock is cycled.

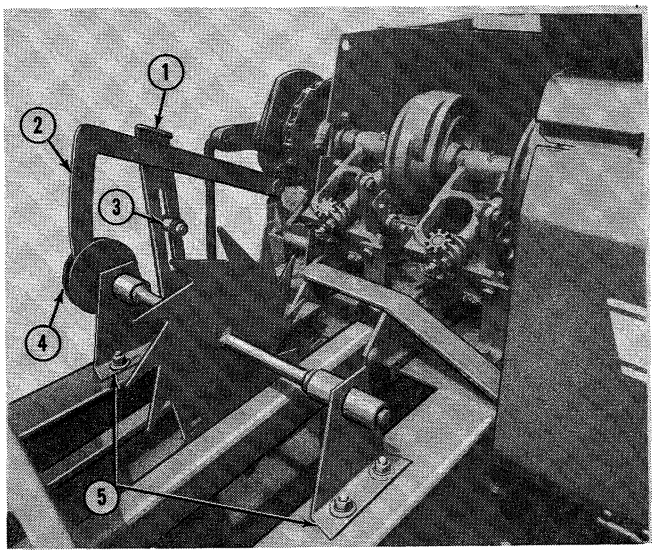


Figure 35
Bale Length and Metering Wheel Adjustment

PLUNGER ADJUSTMENTS

The Series 532 Baler Plunger, Figure 38, differs from the Series 542 Heavy Duty Baler Plunger, Figure 39, in that it has two wear plates in place of the two lower right-hand horizontal side rollers shown in Figure 39. The adjustment procedures which follow pertains to both series plungers. Where adjustment procedures differ between the two plungers, specific information is presented for each plunger. When performing the plunger adjustments, the terms right, left, front and rear should be interpreted in relation to the direction of forward travel of the baler.

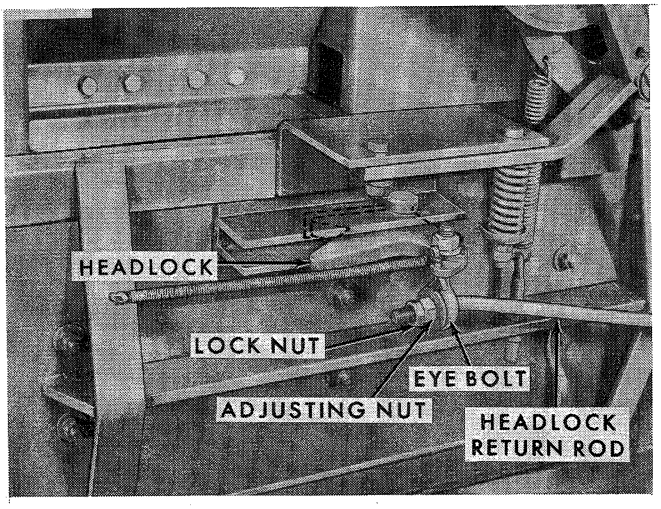


Figure 36
Plunger Head Lock Adjustment

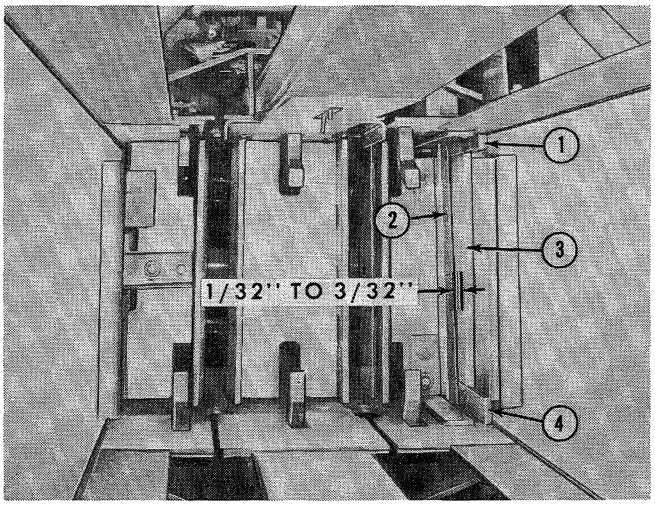


Figure 37
Plunger and Stationary Knife Clearances

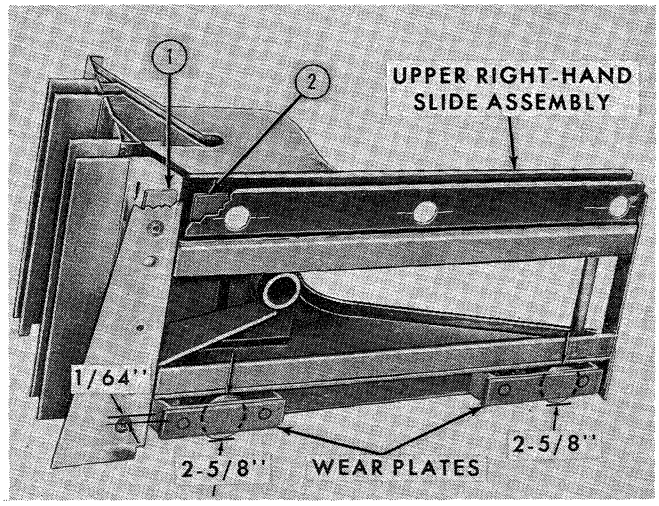


Figure 38
Series 532 Hay Baler Plunger –
Side Baffle Removed for Illustration Purposes

Knife Clearance

To provide a clean cut, reduce power requirements, and prevent undue strain on the baler plunger, maintain a 1/32" to 3/32" clearance between the plunger knife (2), Figure 37, and the stationary knife (3). Both knives should be periodically checked for sharpness. If necessary, they should be removed and sharpened, maintaining their original bevel as near as possible.

The edges of the upper and lower knife guides (1) and (4), Figure 37, should extend beyond the stationary knife (3), approximately 1/32" to 3/64". Less clearance may result in clashing of the stationary and plunger knives. As the knife guides become worn, the knife clearance will decrease, and the plunger may develop side play. When this happens, remove the knife (3), and upper and lower guides, (1) and (4), and shim as required to obtain the 1/32" to 3/32" clearance between the plunger knife and stationary knife, being certain the guides are shimmed 1/32" to 3/64" beyond the stationary knife. If the knife guides become excessively worn, it may be necessary to replace the stationary knife and upper and lower guides.

Series 532 Hay Balers: A clearance of flush to 1/64" should be maintained between the plunger knife and the outer surface of the lower right-hand wear plates, Figure 38. Less clearance could cause knife clashing and should be corrected by removing one or more shims from between the mounting plate and knife.

Series 542 Heavy Duty Balers: A clearance of flush to 1/64" should be maintained between the plunger knife and the lower right-hand horizontal side rollers, as shown in Figure 39. Less clearance could cause knife clashing and should be corrected by removing one or more shims from between the mounting plate and knife.

Plunger Clearances

After extensive use, or at the end of the baling season, it may be advisable to remove the plunger from the bale chamber and examine the plunger and related parts for wear.

The following procedure outlines the recommended method of checking and adjusting the plunger for proper clearances in the bale chamber.

1. Remove the plunger from the bale chamber.

2. Check each 2-5/8" dimension between the bottom surface of the lower right-hand vertical side rollers and the bottom surface of the plunger side support as shown in Figures 38 and 39. If the 2-5/8" dimensions are not obtained, adjust the rollers by means of the cams (3), Figure 40, at each roller. Loosen the cam nut only enough to allow the cam to rotate to the desired position, then tighten the nut.

3. Remove the upper right-hand front guide assembly from the bale chamber by removing the four nuts, lock washers, and serrated washers from the guide retaining bolts located on the top outer surface of the bale chamber. Slide the guide back and forth through the upper right-hand slide assembly, Figures 38 and 39. The guide should

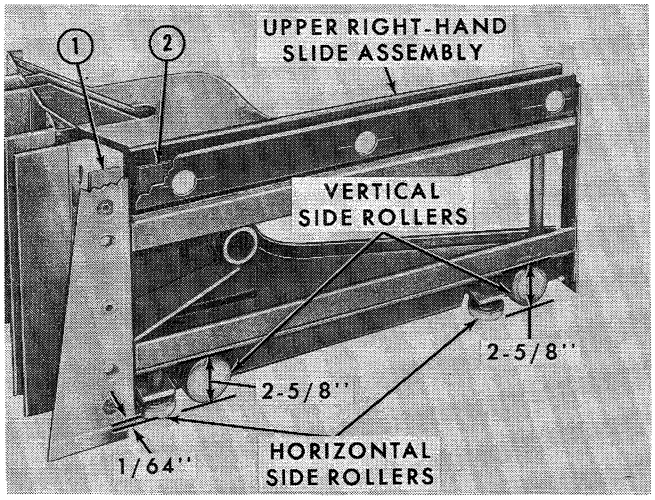


Figure 39
Series 542 Heavy Duty Hay Baler Plunger – Side Baffle Removed for Illustration Purposes

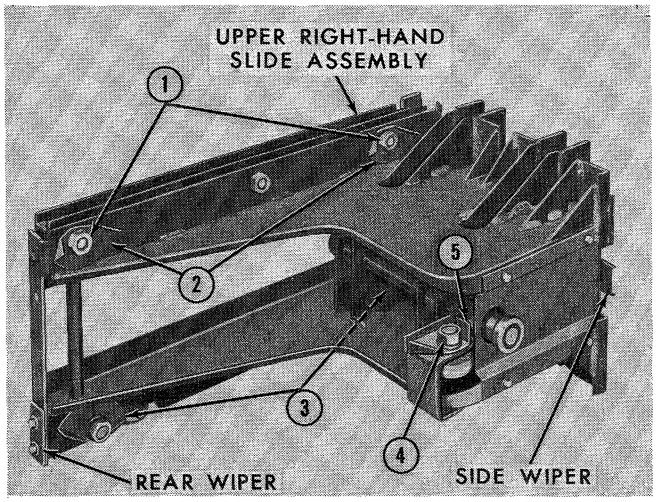


Figure 40
Cam Location – Series 542 Heavy Duty Hay Baler Plunger Shown

fit snug throughout the entire stroke without binding. Add or remove shims (2), Figures 38 and 39, as required to obtain this relationship. Reinstall the guide in the bale chamber so the grooves in the four serrated washers are at right angles to their mating surfaces. Do not tighten the nuts on the guide retaining bolts.

4. **Series 532 Hay Balers:** A clearance of flush to 1/64" should be maintained between the plunger knife and the outer surface of the lower right-hand wear plates, Figure 38. Examine the wear plates for excessive wear. They may be turned end-for-end to provide a new wearing surface. Remove shims from the plunger knife at (1), as required to obtain the flush to 1/64" plunger knife clearance.

   Series 542 Heavy Duty Hay Balers: A clearance of flush to 1/64" should be maintained between the plunger knife and the lower right-hand horizontal side rollers, Figure 39. Remove shims from the plunger knife at (1) as required to obtain this clearance.

5. The edges of the upper and lower knife guides, (1) and (4), Figure 37, should extend beyond the stationary knife (3) by approximately 1/32" to 3/64". If the knife guides are excessively worn, it may be necessary to replace the stationary knife and upper and lower guides. If replacement is necessary, shim the upper and lower knife guides (1) and (4), so that they extend 1/32" to 3/64" beyond the knife.

6. Loosen the upper right-hand rear guide, Figure 41, then install the plunger in the bale chamber.

7. A maximum vertical clearance of 3/16" should be maintained between the top edge of the plunger face panels and the top inner surface of the bale chamber at each end of the plunger travel as shown in Figure 41. To obtain the clearance:

   a. Loosen the cam nuts at (1), Figure 40, and rotate the cams (2) until the upper right-hand slide assembly is positioned downward approximately 1/4".

   b. Loosen the nuts on the top left-hand roller guide retaining bolts at (1), Figure 42, and position the serrated washer on the middle bolt so that the grooves in the washer are at right angles to the grooves in its mating surface.

   c. Position the plunger so that the knives are aligned at the cutting point.

   d. Using a suitable pry bar, check the vertical movement of the plunger at both the front and rear. The clearance should not exceed 3/16" between the top edge of the plunger face panels and the top inner surface of the chamber when the plunger is at each end of its stroke. If necessary, adjust the height of the lower right-hand vertical side rollers by means of the cams (3), Figure 40, until the proper clearance is obtained.

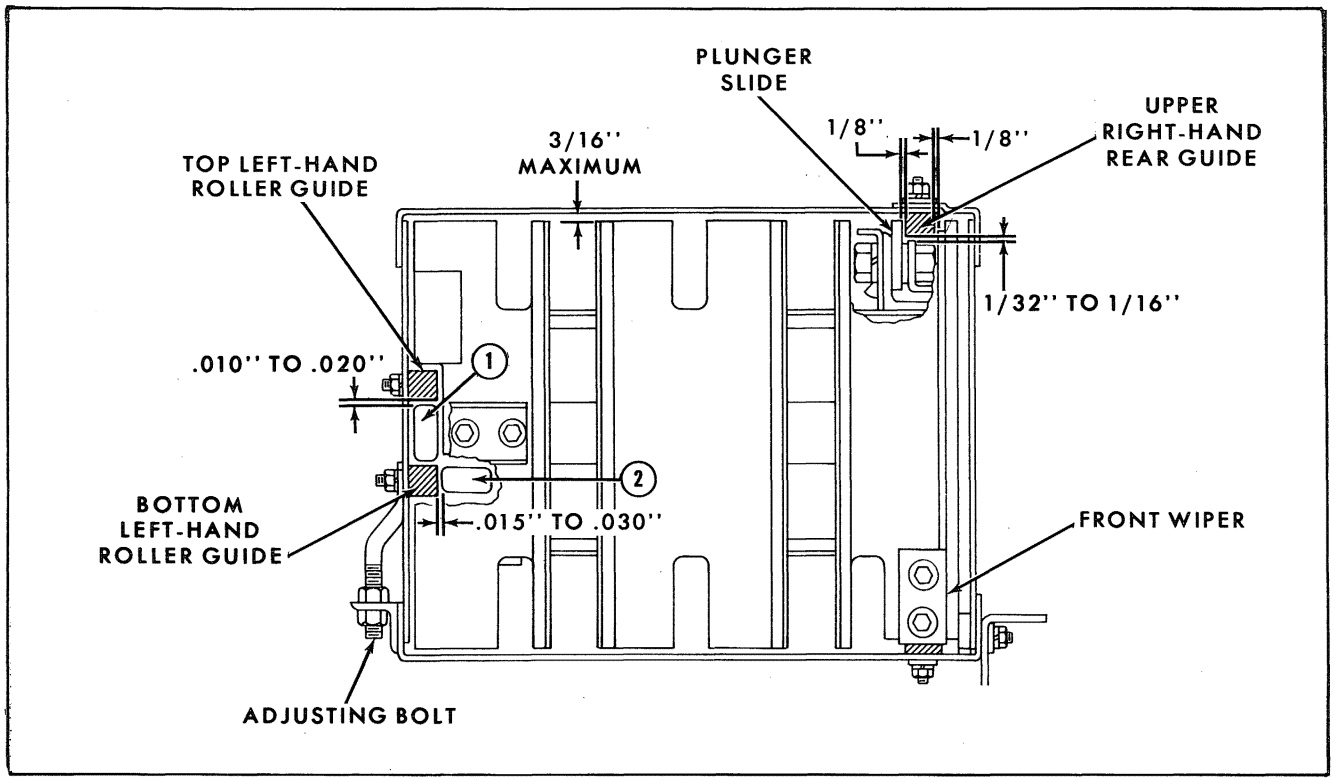


Figure 41
Plunger Clearances

NOTE: *The rollers can be easily adjusted while the plunger is in the forward position in the bale chamber; however, it is necessary to check the plunger clearance at both the forward and rearward position in the bale chamber to be certain there is no binding along the full travel of plunger.*

8. The bottom left-hand side roller guide, Figure 41, should be adjusted vertically to parallel the the plunger knife with the stationary knife. The guide should be parallel with the inner surface of the chamber bottom. Adjust the guide as follows:

   a. Position the plunger so that the knives are aligned at the cutting point.

   b. Loosen the nuts on the bottom left-hand roller guide retaining bolts at (2), Figure 42, and position the serrated washer on the middle bolt so that the grooves in the washer are at right angles to the grooves in its mating surface.

   c. Back off the lock nuts on each of the two adjusting bolts, Figure 42.

   d. Turn the adjusting nut on each adjusting bolt, Figure 42, until the plunger knife is parallel to the stationary knife and the roller guide is parallel to the bottom surface of the bale chamber. Measure the distance from the top surface of the roller guide to the bottom surface of the bale chamber at each end of the guide to determine if they are equal. Adjust as required.

   e. Position the serrated washer on the middle retaining bolt (2), so that the grooves in the washer align with the grooves in its mating surface. Tighten the lock nut on each adjusting bolt, then tighten the nuts on the guide retaining bolts (2).

9. Adjust the top left-hand roller guide, Figure 41, so that a .010" to .020" clearance exists between the bottom surface of the roller guide and the top surface of the roller (1), when the plunger is positioned at each end of its stroke. Position the serrated washer on the middle retaining bolt (1), Figure 42, so that the grooves in the washer align with the grooves in its mating surface. Then, tighten the guide retaining bolts at (1).

10. The lateral plunger roller (2), Figure 41, should be adjusted so that a clearance of .015" to .030" exists between the lateral roller surface and the face of the left-hand bottom guide. The clearance should extend from a distance of 8" ahead of the stationary knife to the end of the compression stroke. The roller clearance may be .060" to .015" for the remaining plunger travel. To obtain the .015" to .030" clearance, loosen the cam nut at (4), Figure 40, and rotate the cam (5) until the proper clearance exists when the plunger is positioned 8" ahead of the stationary knife and also at the end of its compression stroke.

11. The upper right-hand rear guide should be centered within the plunger slide side plates so that a 1/8" clearance exists on both sides of the guide, as shown in Figure 41. The upper right-hand front guide should be positioned within the plunger slide so that the plunger moves through its complete stroke without binding. To adjust the forward guide, move the plunger through its complete cycle to center the guide. Position the four serrated washers on the guide retaining bolts so that the grooves in the washers align with their mating surfaces. Then, tighten the nuts on the guide retaining bolts. To adjust the rear guide, position the plunger at the end of its compression stroke. Center the upper right-hand rear guide within the plunger slide so that a 1/8" clearance exists on both sides of the guide. Then tighten the nuts on the two guide retaining bolts. Move the plunger through its complete cycle to make certain that there is no binding at any point.

12. The upper right-hand slide adjusting cams (2), Figure 40, should be set to obtain 1/32" to 1/16" clearance between the bottom surface of the upper right-hand guides, and the contact surface of the slide assembly as shown in Figure 41. The dimension should exist at the front and rear of the upper right-hand slide assembly when the plunger is positioned at the end of its compression stroke. The clearance may be 1/32" to 3/16" for the remaining plunger travel. To obtain the clearance, position the plunger at the end of its compression stroke, loosen the cam nuts at (1), Figure 40, and rotate the cams (2), until the correct clearance exists at each end of the upper right-hand slide assembly. Then tighten the cam nuts at (1).

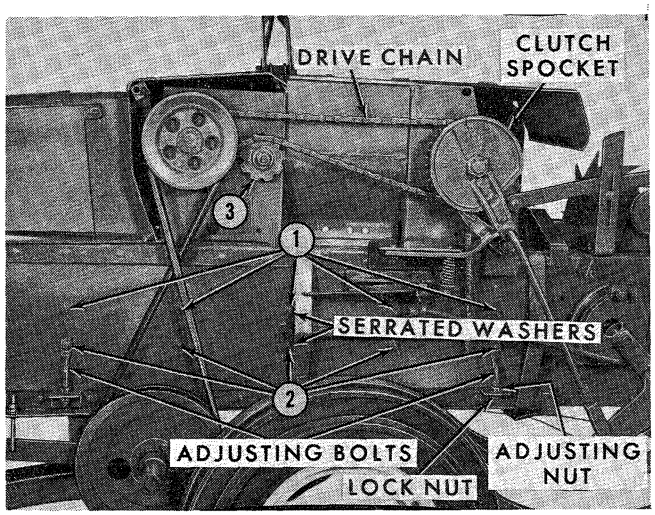


Figure 42
Roller Guide Adjustment

13. Adjust the rear and side wipers, Figure 40, and the front wiper, Figure 41, both horizontally and vertically so that they are as close to the guides as possible without rubbing during the full travel of the plunger.

14. Check the clearance between the plunger knife and the stationary knife. The clearance should be 1/32" to 3/32".

Wiper Adjustment

Under certain crop conditions, there may be a tendency for material to build up on or around the plunger area. Inspect the plunger area periodically and remove any trash which may have accumulated. Proper adjustment of the three plunger wipers will help prevent this condition. The side and rear wipers, Figure 40, and the front wiper, Figure 41, should be adjusted both horizontally and vertically so that they are as close to the guides as possible without rubbing during the full travel of the plunger.

TIMING PROCEDURE–NEEDLES TO PLUNGER

NOTE: *Before timing the baler, check the needles for proper height and clearance. See page 26 or 37.*

To prevent damage to the baler, it is suggested that the operator periodically check the baler for proper timing as outlined below:

KNOTTER OPERATION

1. Trip the knotter mechanism by rotating the metering wheel in the direction of bale travel.

2. Turn the baler flywheel counterclockwise (facing flywheel) until the needle points enter the bale chamber 1/8 to 1/4 inch.

If the plunger face projections are not 1-1/4" to 1-3/4" past the needle points with the plunger on the compression stroke, the baler is not in time and should be corrected as follows:

1. Remove the drive chain, Figure 42, from the clutch sprocket.

2. Turn the flywheel counterclockwise until the projections on the face of the plunger are 1-1/4" to 1-3/4" past the needle points with the plunger on the compression stroke.

3. Turn the clutch sprocket, Figure 42, counterclockwise until the clutch pawl roller engages the dog inside the clutch sprocket.

4. Replace the drive chain, taking the slack out of the top span and fastening the chain at the bottom.

5. Adjust the drive chain tightener (3), until the top span of the chain can be depressed about 1/2".

6. Complete the tying cycle.

7. Trip the tying mechanism, then turn the baler flywheel by hand and check to be sure that the timing is correct.

KNOTTER OPERATION

A study of the knotter mechanism on the Ford Hay Baler will aid the operator in understanding the function of the component parts and will thereby enable him to make necessary adjustments quickly and more easily. A series of illustrations is provided to show knotter action during the various stages of forming and tying a knot.

Looking at the side of the chamber, we see that the end of the baling twine is held by the twine disc, while the bale is formed in the chamber. The twine runs from the disc, around the rear end of the bale, through the needle eye, and back to the ball of twine, Figure 43.

When the bale length has been metered, the knotting mechanism is tripped, and as shown on the left in Figure 44, the needle draws the twine up and around the front of the bale. The needle then places this strand of twine in the twine disc with the top strand, as shown on the right.

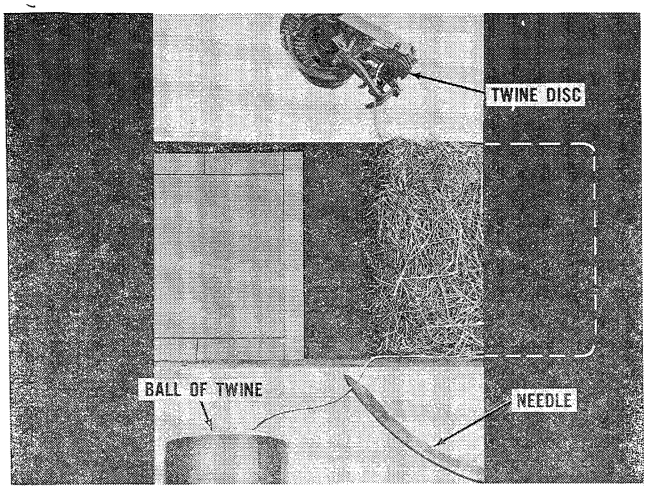


Figure 43
Twine Outline

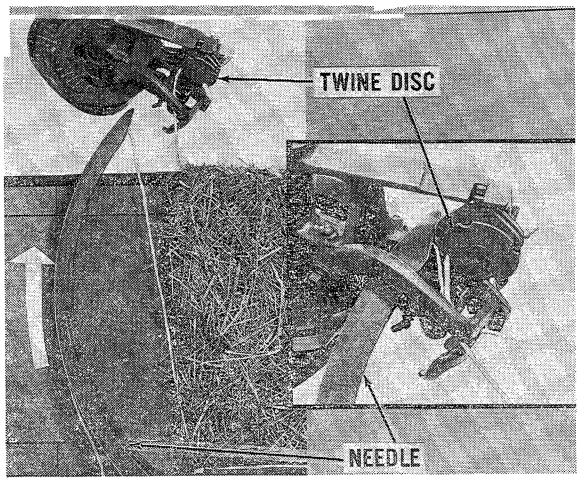


Figure 44
Drawing the Twine Up

The twine finger now pivots and pulls the twine from the face of the needles, as shown on the left in Figure 45. Then, the twine finger holds the twine tightly against the bill hook while it revolves, as shown on the right, to form a loop in the twine.

The bill hook completes its revolution and closes on the twine, holding it tightly. The needle, now on the down stroke, places the twine in the next notch of the twine disc, as shown in Figure 46.

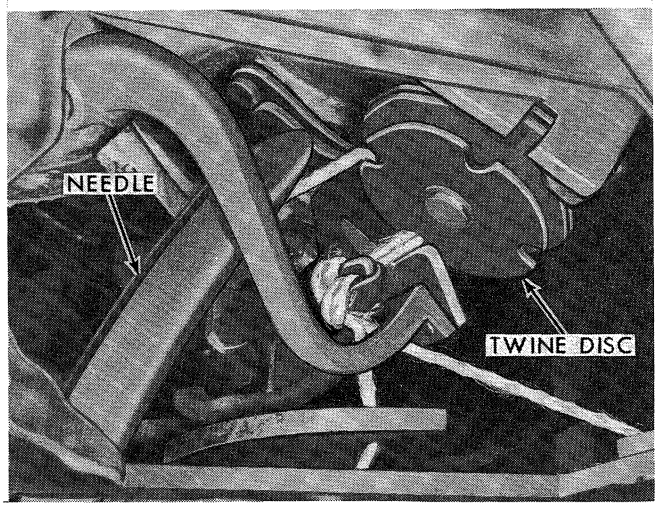


Figure 46
Holding the Twine

The twine knife cuts the double strand of twine, after which the stripper wipes it from the bill hook and completes the knot. The twine finger returns to its forward position while the needle is on the down stroke, Figure 47.

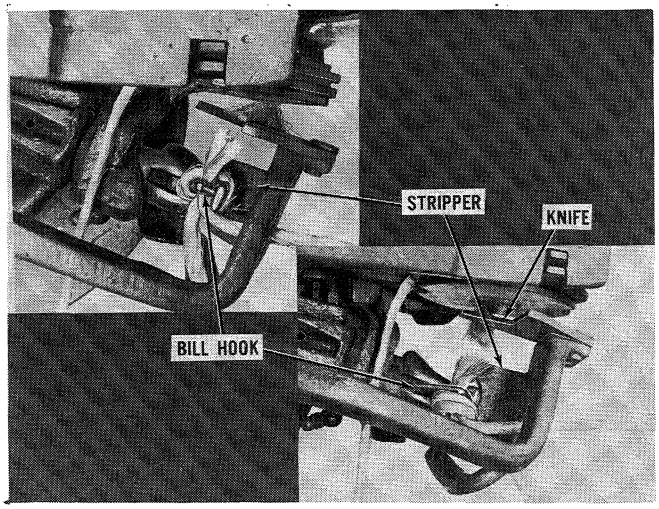


Figure 47
Wiping the Knot and Cutting the Twine

It is important that the baler be in time to prevent damage to the needles. As the needles rise in the baling chamber, the plunger must shield them from the hay, as shown in Figure 48.

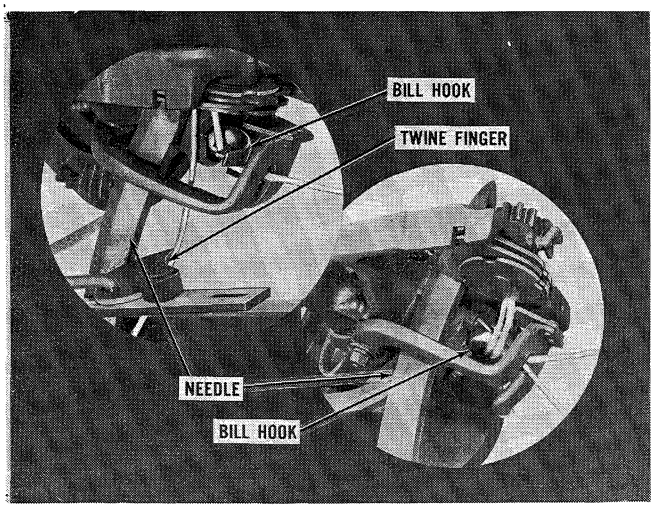


Figure 45
Starting the Knot

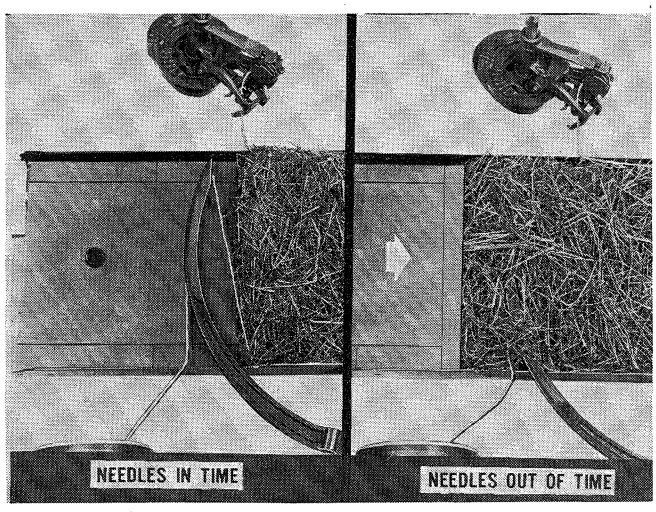


Figure 48
Importance of Timing

KNOTTER ADJUSTMENTS

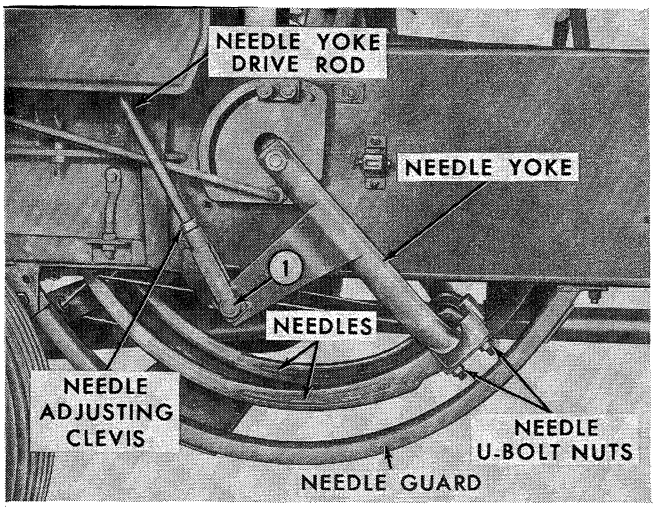


Figure 49
Needle Yoke and U-Bolts

PROPER HEIGHT AND CLEARANCE OF NEEDLES

The function of the needle is to place the twine in the notch of the twine disc. The needle should be adjusted to operate as close to the notch as possible without interfering with the disc or cleaner plate. The twine must be placed in the notch before the disc starts turning. To accomplish this, needle height is important. To obtain the correct needle height, adjust as follows:

1. Trip the knotter mechanism by rotating the metering wheel in the direction of bale travel.

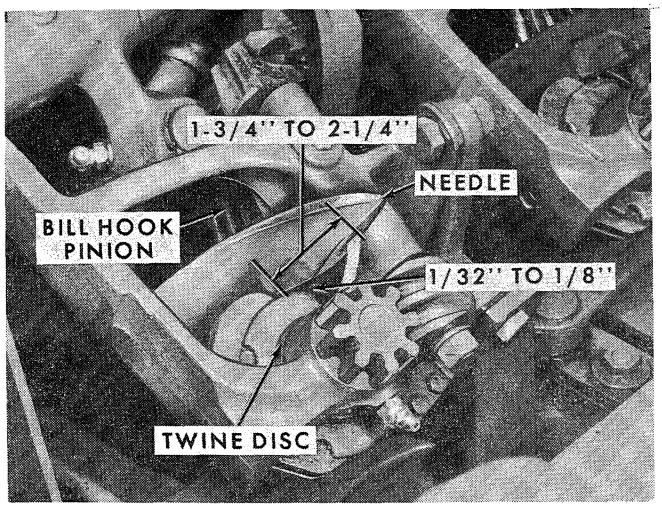


Figure 50
Needle Height

2. Turn the flywheel counterclockwise until the needles are in their uppermost position, or disconnect the needle yoke drive rod at (1), Figure 49, to allow the yoke to swing freely while making the needle adjustment.

3. The clearance between the needles and the bill hook pinion, Figure 50, should be such that the needles just clear the pinion. To adjust, loosen the needle U-bolt nuts, Figure 49, and slide the needles to the right or left to obtain the proper clearance. Left and right needle movement is limited by the width of the slot in the yoke end of the needles, as the needle U-bolts are welded to the yoke. Check step 4 before tightening the U-bolt nuts.

4. The clearance between the needles and the twine discs should be 1/32" to 1/8", as shown in Figure 50. To bring the needles closer to the twine discs, loosen the rear nuts on the needle U-bolts, and tighten the front nuts. To increase the distance, loosen the front nuts and tighten the rear nuts. When the adjustment is completed, recheck the needle U-bolt nuts to make certain they are tight.

5. The proper height of needle travel is determined by measuring the distance from the twine discs to the bottom of the needle eyes. This distance should be from 1-3/4" to 2-1/4" with the needles in their uppermost position, as shown in Figure 50. To adjust the height, loosen the jam nut and remove the clevis pin from the needle adjusting clevis shown in Figure 49. Turn the clevis until the correct measurement is obtained, secure the clevis to the needle yoke arm with the clevis pin and cotter pin, then tighten the jam nut.

THREADING THE NEEDLES

1. Place three balls of twine (2), (4), and (6), Figure 51, proper end up, in the twine compartment so they are adjacent to the twine ball guides.

2. Thread the inside end of ball (6) through the forward guide in the top of the compartment, then tie it to the outer end of ball (4).

3. Thread the inside end of ball (4) through the next forward guide and tie it to the outer end of the feed ball (2). Then thread the inside end of ball (2) through the next forward guide.

KNOTTER ADJUSTMENT

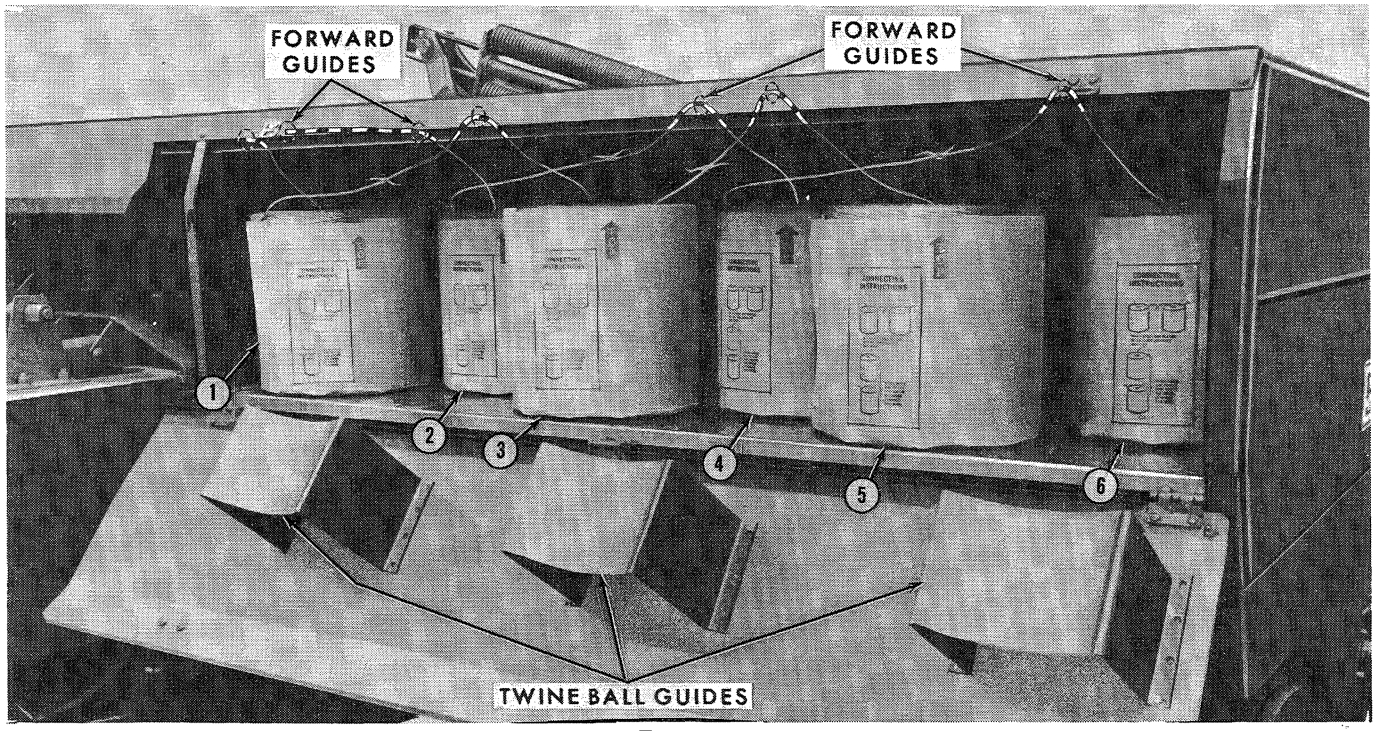


Figure 51
Twine Compartment

4. Place three more balls of twine (1), (3), and (5), proper end up, in the twine compartment as shown in Figure 51.

5. Thread the inside end of ball (5) through the rear guide in the twine compartment, then tie it to the outside end of ball (3).

6. Thread the inside end of ball (3) through the next rear guide and tie it to the outer end of the feed ball (1).

7. Thread the inside end of feed balls (1) and (2) through the guides and tension bracket as shown in Figure 52. Run the twine through the lower twine guides and needle eyes as shown in Figure 53, then tie the ends to the needle yoke.

8. Trip the knotter mechanism by rotating the metering wheel in the direction of bale travel.

9. Start the baler engine and engage the drive belts or tractor P.T.O. to complete the tying cycle.

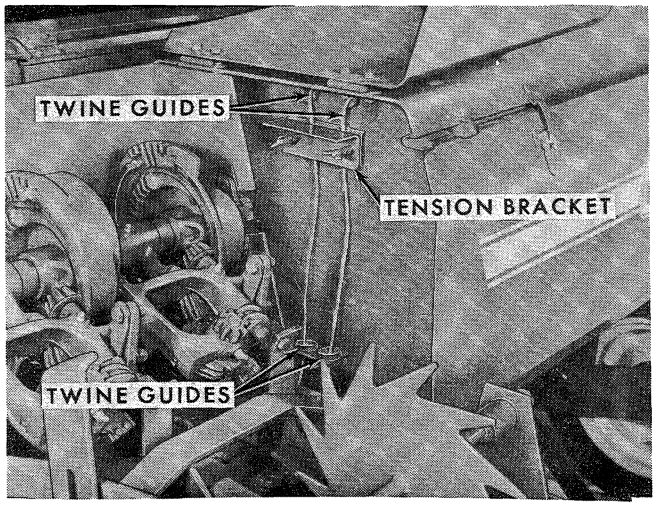


Figure 52
Twine Tension Bracket and Twine Guides

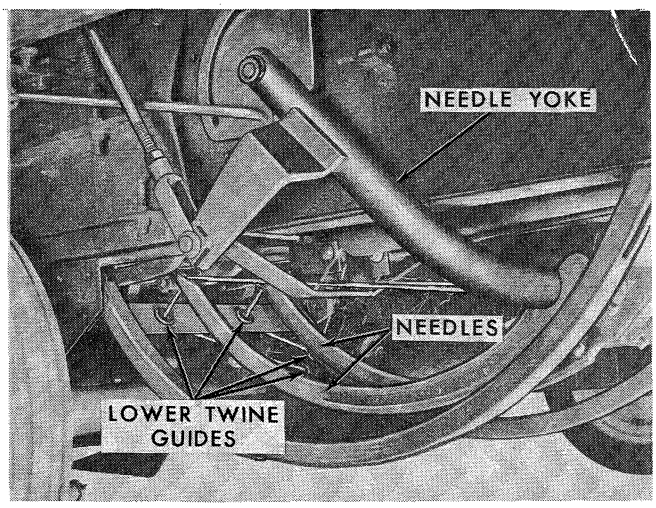


Figure 53
Threading the Needles

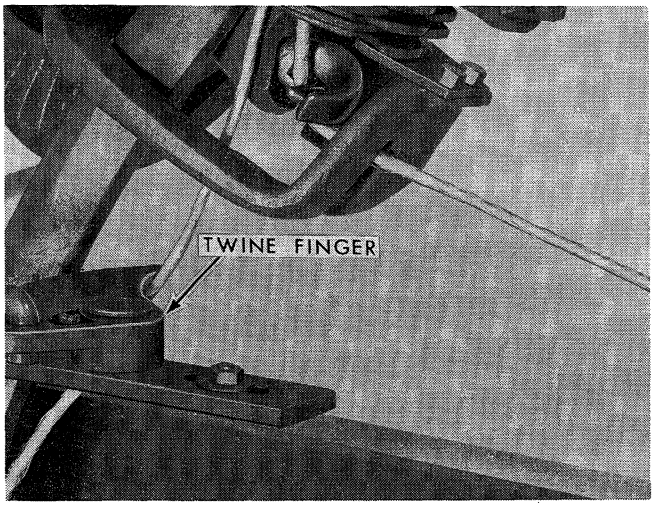


Figure 54
Twine Finger

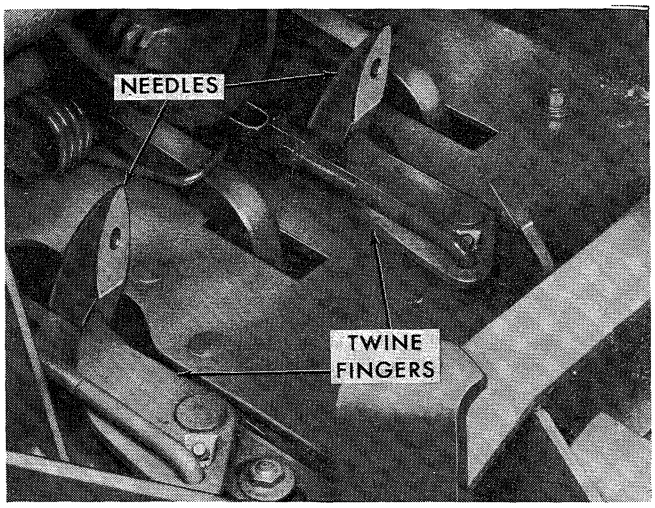


Figure 55
Finger to Needles

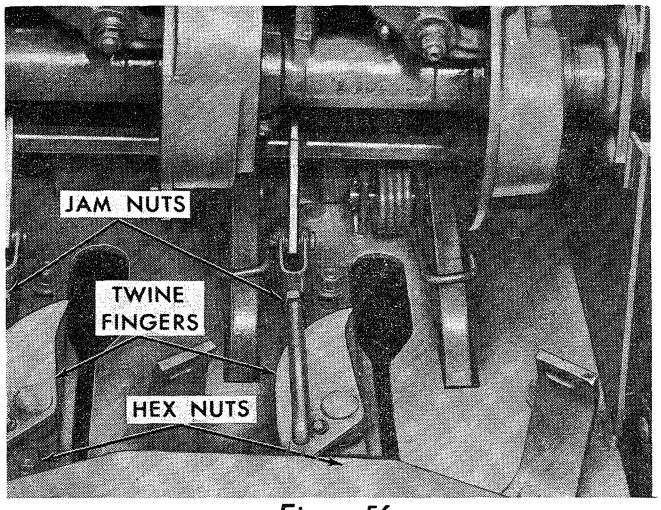


Figure 56
Finger Adjustment

10. Untie the twine from the needle yoke and pull the loose ends of twine from the knotter assembly. Check to make sure that no twine is left on the bill hooks.

TWINE FINGERS

The job of the twine finger, Figure 54, is to pick the twine from the face of the needle and place it against the bill hook.

To do this, it is important that the twine finger be adjusted to pass closely to the needle, Figure 55. This will enable it to pick up the twine even when the twine is pushed forward toward the needle by the hay in the baling chamber. Of course, the needles should be correctly adjusted first.

1. Trip the knotter mechanism and turn the flywheel counterclockwise until the needle points pass through the slots in the top of the bale chamber for a distance of 3" above the twine finger top surfaces, and the twine finger points are in the middle of the needle slots. The clearance between the twine fingers and the needles should be approximately 1/8" to 1/16" to enable the twine fingers to pick up the twine as they rotate across the needle slots.

2. To adjust the fingers, loosen the jam nuts and remove the hairpins and clevis pins from the two clevises, shown in Figure 56.

3. Loosen the two hex nuts, shown in Figure 56, which secure the twine finger assemblies to the frame. Move the assemblies backward or forward until the above clearance is obtained and tighten the nuts.

4. Turn the flywheel until the needles are in the full down position and the knotter clutch is disengaged.

5. Turn the clevises, shown in Figure 56, until the twine finger points are .030" from the left edge of the needle slots in the top of the bale chamber as shown. At the same time, apply pressure to the fingers in a clockwise direction to remove linkage end play. Attach the clevises to the cam tracer arms with the clevis pins and hair pins, and secure with the jam nuts.

6. Check the position of the tracer arm in the track of the knotter cam gear. The arm must be free through the complete rotation of the gear and the cam follower roller must be free to rotate.

7. With twine threaded through the baler needles, trip the knotter mechanism and turn the flywheel slowly until the needles are in their uppermost position, then observe the position of the twine against the bill hooks. When properly adjusted, the twine fingers should hold the twine against the bill hook so that the twine will not slip off as the bill hook starts to rotate. See Figure 57.

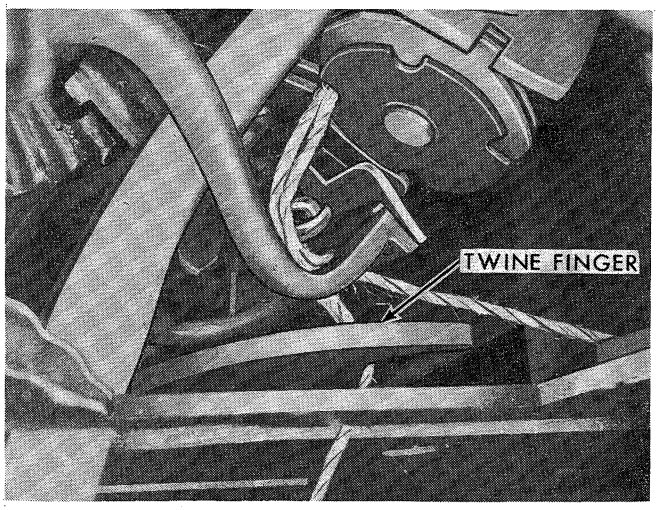


Figure 57
Holding Twine Against Bill Hook

Here in the upper left of Figure 58 we see the twine finger has failed to pick up the twine. The center picture shows the results of this failure. The strand brought up by the needle is not held against the bill hook, and therefore the knot isn't tied in that end. The result is no knot in the front strand around the bale.

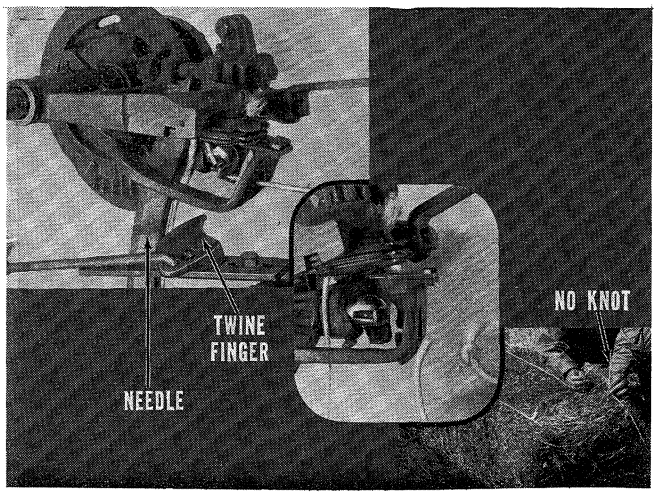


Figure 58
Finger Problem

TWINE DISC

To receive the twine, the notches in the twine discs must be in proper relationship to the twine holder. The twine disc timing may be checked with or without twine in the twine holder. With twine in the holder the twine disc timing is correct if the right-hand edge of the notch in the disc leads slightly into the twine holder as shown in Figure 59.

Without twine in the holder, the timing is correct if the center of the notch aligns with the left-hand edge of the holder. Closely observe Figure 60 which shows the disc properly positioned without twine in the holder.

If adjustment is necessary, loosen the worm gear nut, then rotate the worm gear in the direction of shaft rotation to advance the disc until the proper relationship exists. Tighten the nut to secure the gear in position on the tapered shaft.

NOTE: *Rotating the worm gear in the direction of shaft rotation will remove any backlash between the worm gear and twine disc pinion.*

Timing the twine disc must be checked with the twine in the holder, and after tying at least two knots. If the right-hand edge of the notch in the disc blends with the twine holder as shown in Figure 59, timing is correct. If necessary, the nut (1), Figure 61, and worm gear can be loosened, then rotated to advance or retard the disc. Tighten the nut to secure the worm gear in position.

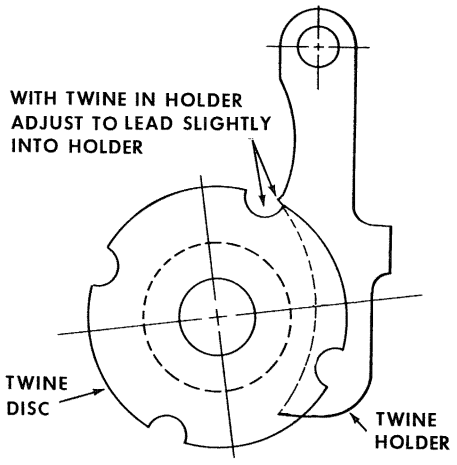


Figure 59
Twine Disc Adjustment with Twine in Holder

KNOTTER ADJUSTMENT

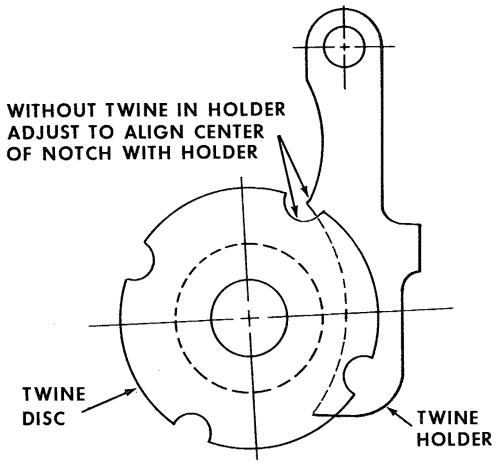


Figure 60
Twine Disc Adjustment Without Twine in Holder

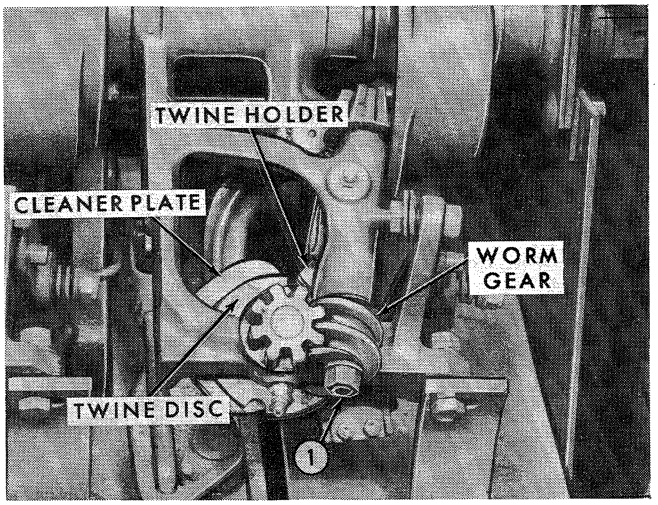


Figure 61
Twine Disc

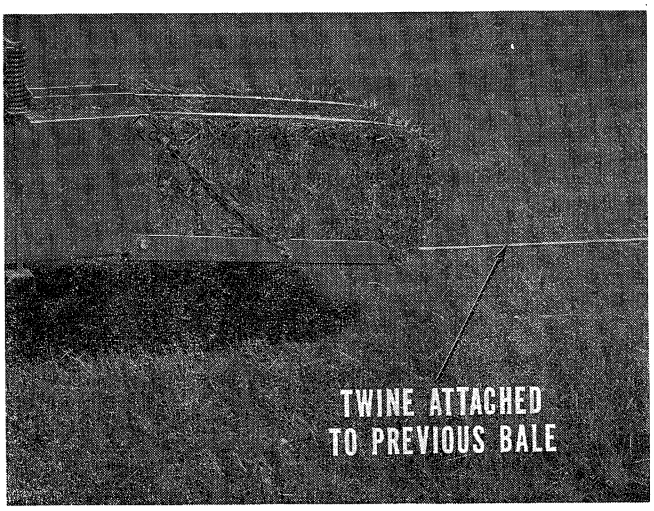


Figure 62
Disc Problem

If the twine is not placed in the notch, the twine remains attached to the previous bale as shown in Figure 62. The next illustration, Figure 63, shows why this happens.

In the upper picture you see the bill hook picked up the twine as usual. Note, however, that the twine was not placed in the disc and consequently, it was not in position to be cut by the knife. Instead, the uncut twine is pulled out with the bale as it leaves the chamber.

TWINE HOLDER

The twine must be held in the disc, Figure 64, while the bale is being formed and the knot is tied. Twine holder tension is important, as illustrated in the next paragraphs.

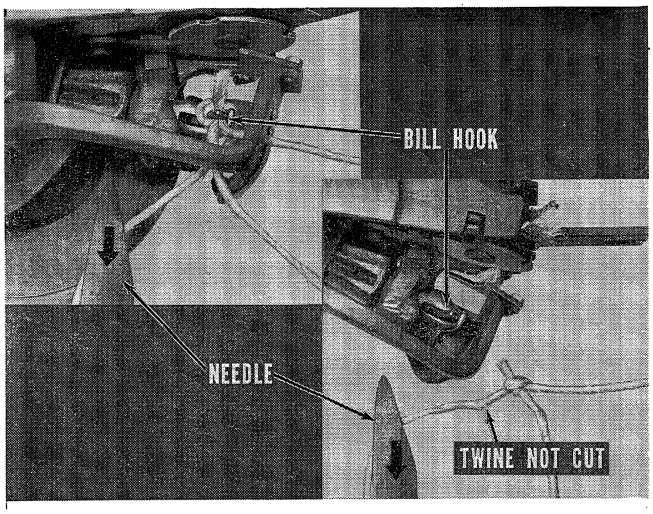


Figure 63
Twine Was Not Cut

KNOTTER ADJUSTMENT

At the right of Figure 65 is an example of what happens when there is insufficient tension on the twine holder. The top strand is pulled out of the twine disc. The same thing may happen when there is too much pull on the twine due to excessive tension either at the bale or at the twine tension bracket. Since the top strand was pulled out of the disc and away from the bill hook, a knot was tied in the front strand only. Again, the result is a bale with no knot in one strand.

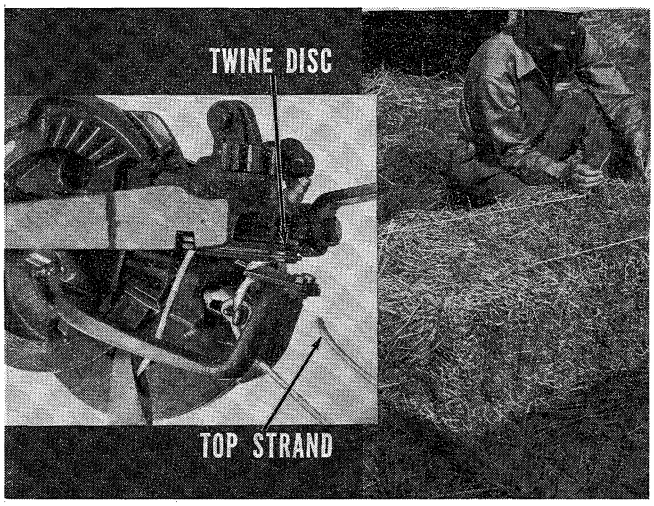


Figure 65
Holder Problem

Insufficient tension on the holder will occasionally permit the end from the top strand to be pulled from the twine disc by the knife, during cutting, as shown in Figure 66.

The result is a knot with one long end, Figure 67. Usually this long end isn't pulled completely out of the knot forming a single loop as shown.

NOTE: *Excessive twine tension at the twine container, excessive bale tension, or a dull twine knife may also cause the twine to be pulled from the twine disc. These adjustments should be checked and corrected before changing the tension of the twine holder.*

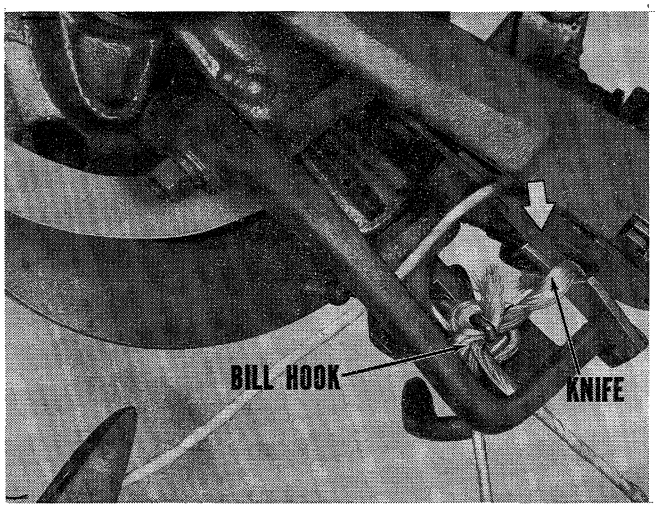


Figure 66
Insufficient Holder Tension

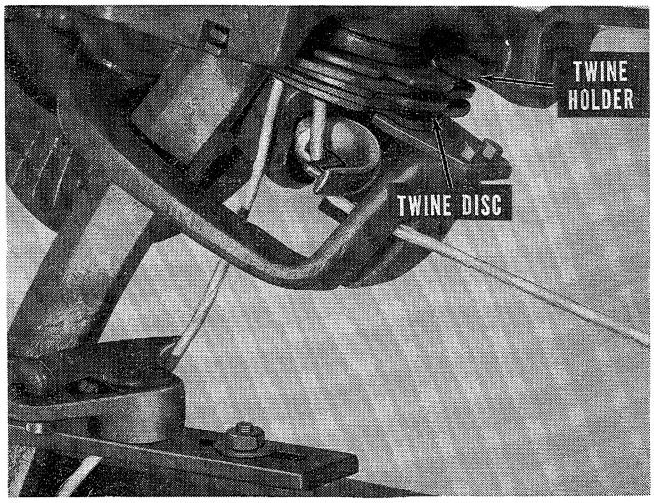


Figure 64
Twine Holder

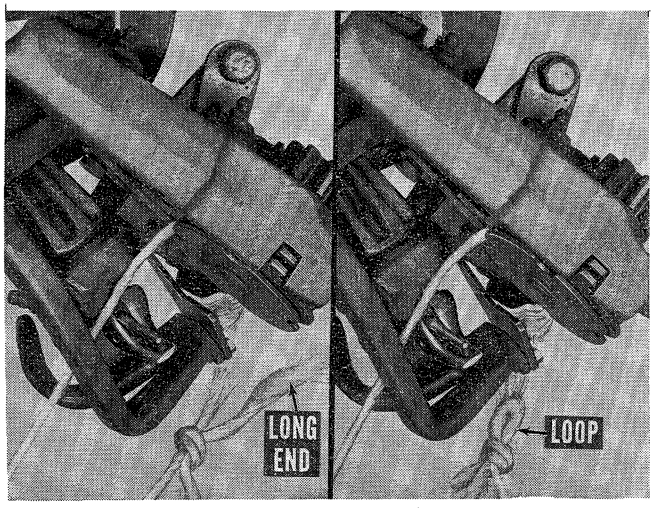


Figure 67
Holder Problem

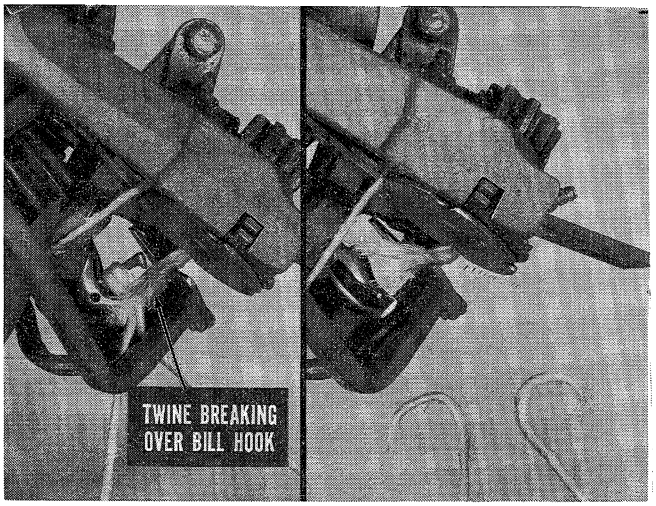


Figure 68
Too Much Tension

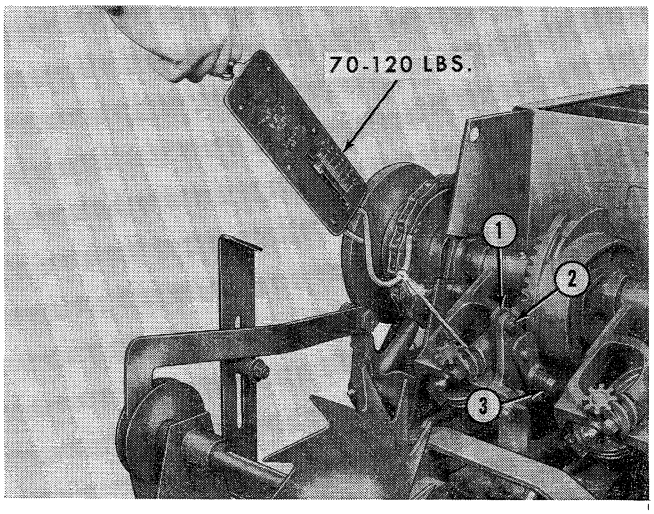


Figure 69
Checking Twine Tension

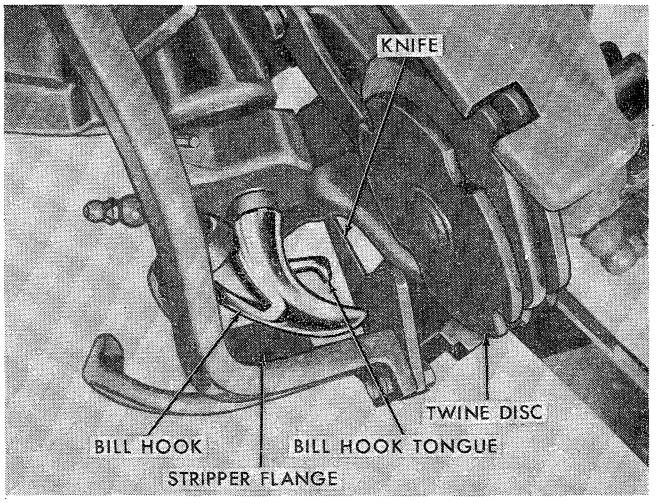


Figure 70
Bill Hook

During tying, the bill hook pulls about 1/4" of twine from the twine disc. If the tension at the twine holder is too great, the twine cannot be pulled from the disc. This results in the twine breaking over the bill hook without tying a knot as shown in the illustrations of Figure 68. Tension on the twine holder should be just enough to hold the twine while the bale is formed and the knot tied.

Tension is correct when 70—120 lbs. parallel pull is required to pull the twine out of the twine disc. See Figure 69.

To adjust the tension on the twine holder, loosen the jam nut (2), Figure 71, and increase or decrease the tension gradually by turning the bolt (1), 1/4 turn at a time. After adjusting, tighten the jam nut (2), securely.

IMPORTANT: *Do not over tighten.*

BILL HOOK

The loop is formed by the bill hook, Figure 70, which also holds the ends of the twine while the stripper completes the knot.

If there is not enough tension on the bill hook tongue, it will not pull the twine ends through the loop as it is wiped off by the stripper. This results in no knot in either end of the twine, as shown in Figure 71. Or, if the ends are pulled through, the knot is loosely tied. In some cases the ends are pulled only partly through, forming a single or double loop.

On the other hand, too much tension on the bill hook increases wear on the knotter and causes the bill

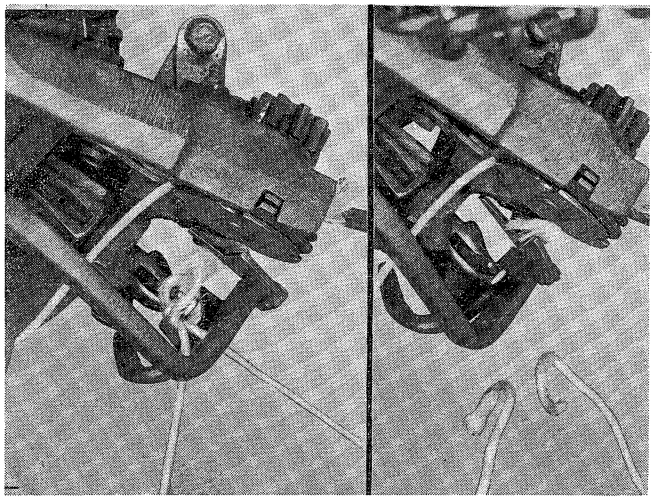


Figure 71
Insufficient Bill Hook Tension

hook to hold the ends of the twine after the knot is tied, Figure 72. Usually, the knot is pulled from the bill hook by the bale without breaking the twine. Bill hook tension should only be sufficient to hold the twine while the knot is tied.

Adjust the bill hook tongue by either tightening or loosening the lock nut (3), Figure 69, 1/4 turn at a time until a tension of 10 to 20 lbs. on the bill hook will separate the jaws 1/8", Figure 73.

KNIFE AND STRIPPER

As the bill hook, shown in Figure 70, revolves and picks up the twine from the twine disc, the knife passes between the bill hook and the twine disc, cutting the twine. The stripper flange then rides along the heel of the bill hook, and wipes the loop of twine off the bill hook to complete the tying operation, Figure 74.

If the stripper, Figure 75, does not contact the bill hook it will pass over the twine without stripping it off—or ride on the twine and cut the fibers. If the stripper rides too heavily on the bill hook, it will cause excessive wear on the knotter.

The stripper flange should start contacting the curved surface of the bill hook heel about 5/8" to 11/16" from the tip end of the bill hook. If necessary, the knife arm may be adjusted by bending it carefully.

NOTE: *The knotter knife blades should be replaced or sharpened with a hone when they become dull.*

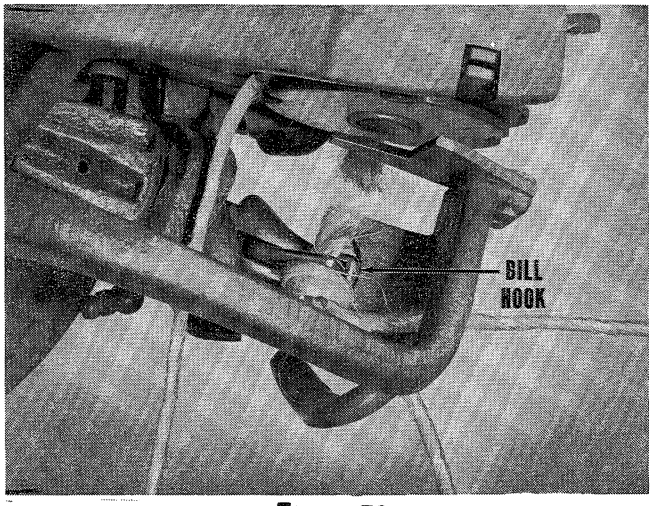


Figure 72
Too Much Bill Hook Tension

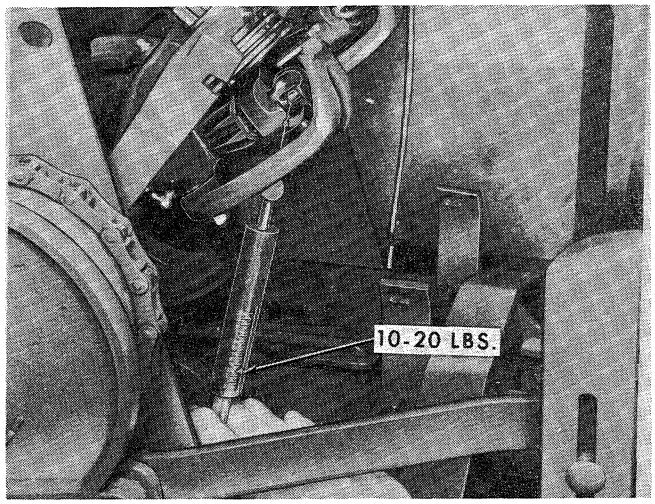


Figure 73
Checking Bill Hook Tension

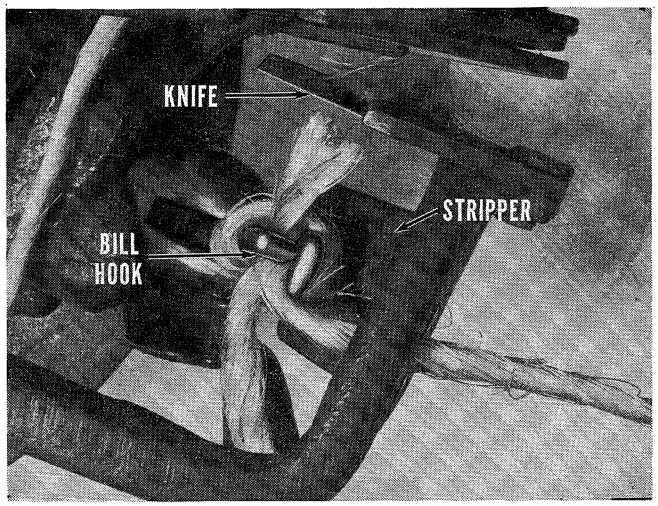


Figure 74
Knife and Stripper

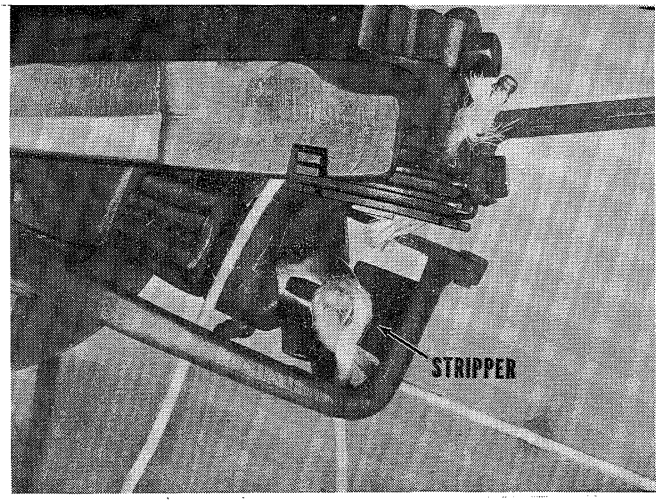


Figure 75
Wiping the Knot

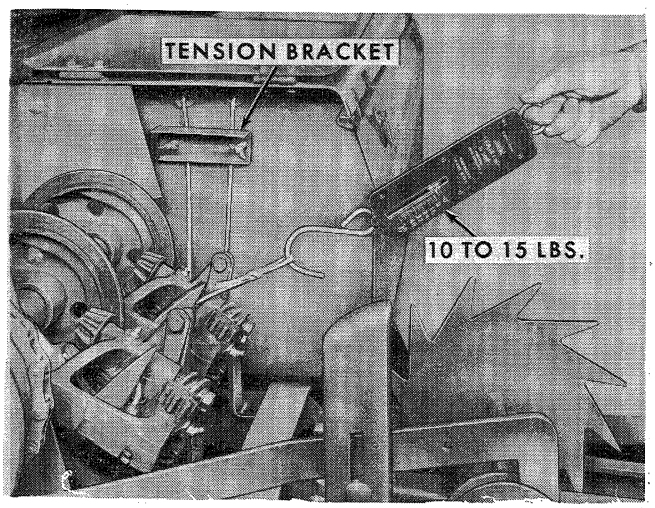


Figure 76
Checking Twine Tension

TWINE TENSION

Adjust the tension bracket to achieve 10–15 lbs. pull of twine through the needles as shown in Figure 76.

Rotate the twine guides to prevent excessive wear one one side.

TWISTER OPERATION

The twister assembly, Figure 77, is actuated at the completion of each bale, when the metering wheel trips the twister clutch. After the clutch is tripped, the needles move up and position the wires between the knives and the knife blocks. At this point, the twister begins to turn. After approximately 1-3/4 turns, the shuttle bar is actuated. This moves the knives laterally to the other sides of the knife blocks, releasing the held wires, Figure 78, and simultaneously cutting and crimping the wires placed in position by the needles.

By the time the held wires are released by the knives, the twister fingers have secured the wires and have begun the twisting process, Figure 78. The crimped wires remain solidly fixed between the knives and knife blocks. Throughout the twister cycle, the ends of the cut wires are held in place by the wire deflector rods, Figure 77. As soon as the twister shafts begin to turn, the needles drop into position for the next bale.

More information about the knives, including proper crimping of the wire, is presented in the Twister Adjustments Section.

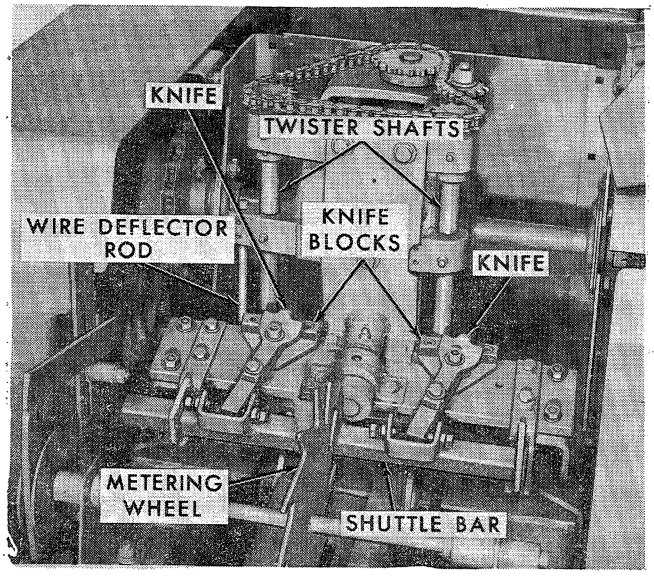


Figure 77
Twister Assembly

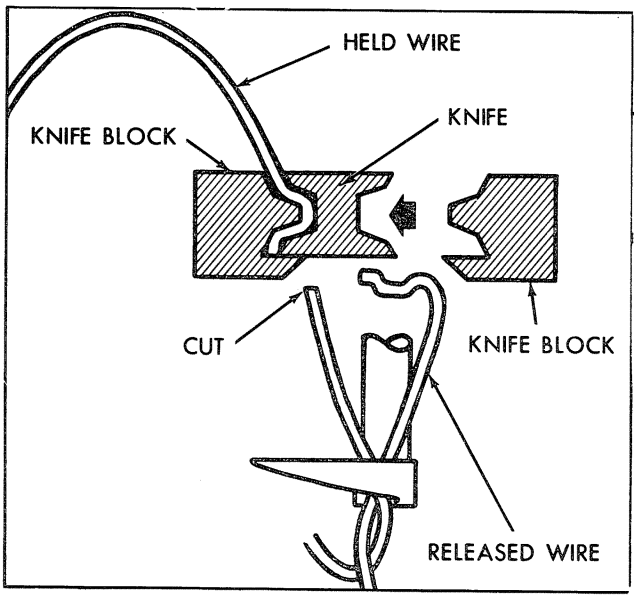


Figure 78
Forming the Twist

TWISTER ADJUSTMENTS

THREADING THE NEEDLES

Using A.S.A.E. 14-1/2 gauge standard baling wire, thread the needles as follows:

1. Slide four wire containers, Figure 79, into the wire compartment as far as possible.

2. Splice the inside wire from container (4) to the outside wire from container (3). Then splice the inside wire from container (2) to the outside wire from container (1). Form a tight splice, as shown in the Insert, Figure 79, being sure to cut the tail on each end of the twist as close as possible, so that the splice will pass freely through the guides and rollers.

3. Thread the inside wires from containers (1) and (3) through the adjacent guides and down through the floor guides, Figure 79. Continue by threading the wire from container (1) through the left-hand guide on the feed platform access door and the rear guide on the axle bracket. Then thread the wire from container (3) through the right-hand guide on the feed platform access door and the forward guide on the axle bracket.

NOTE: *After the baler is placed in operation, the guides should be rotated periodically to prevent excessive wear at any one point.*

4. Move to the left side of the baler and proceed as follows:

   a. Thread the wire extending from the rear guide [container (1) wire] through the guide in the left guide bracket and around the left wire sheave as shown in the Insert, Figure 80.

   b. Pull the wire up between the left roller guide brackets (3), beneath bolt (1), and over bolt (2), (illustrated on right-hand guide).

   c. Bring the wire over the left needle roller and back to the bale chamber brace. Secure the wire to the brace.

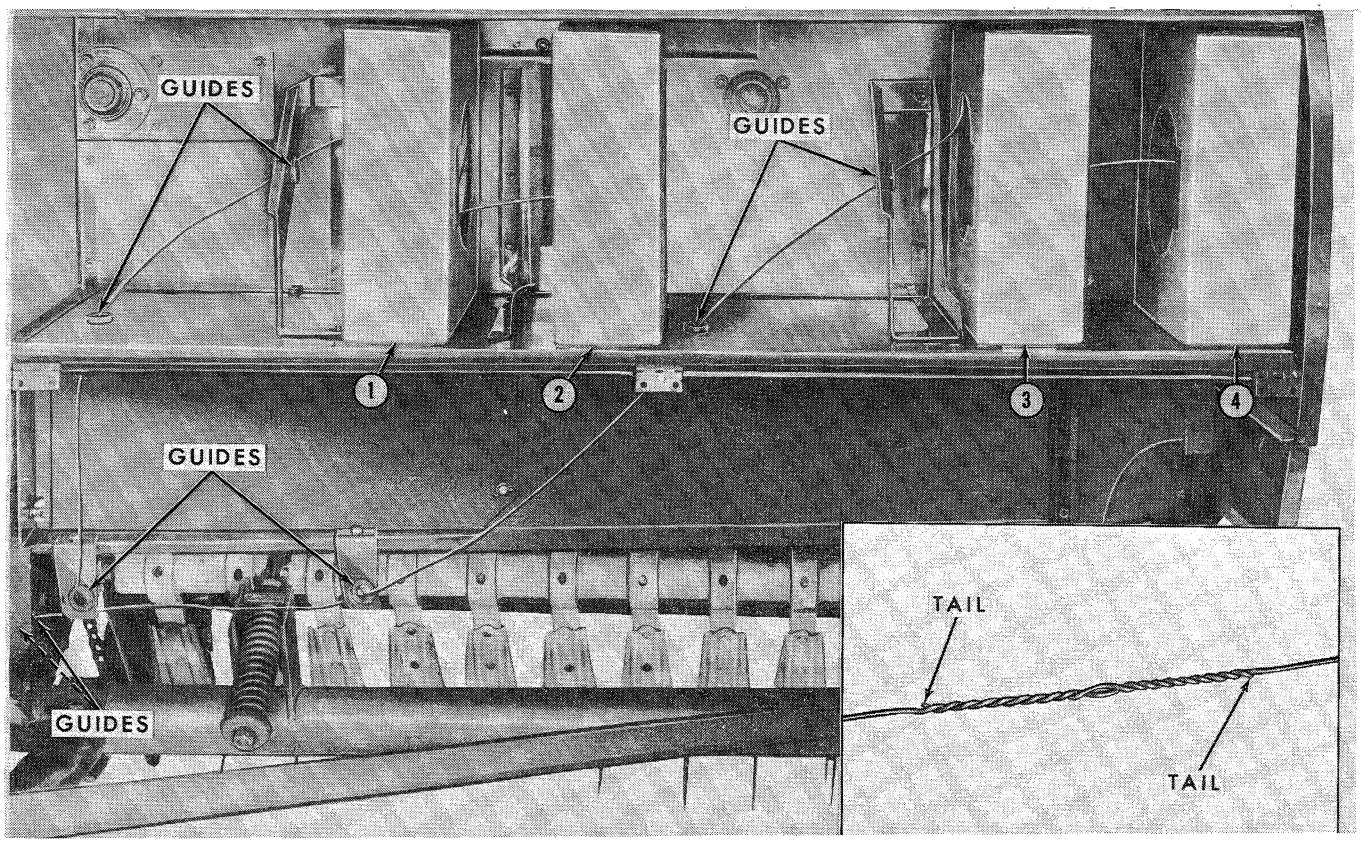


Figure 79
Wire Compartment – Door Removed for Illustration Purposes

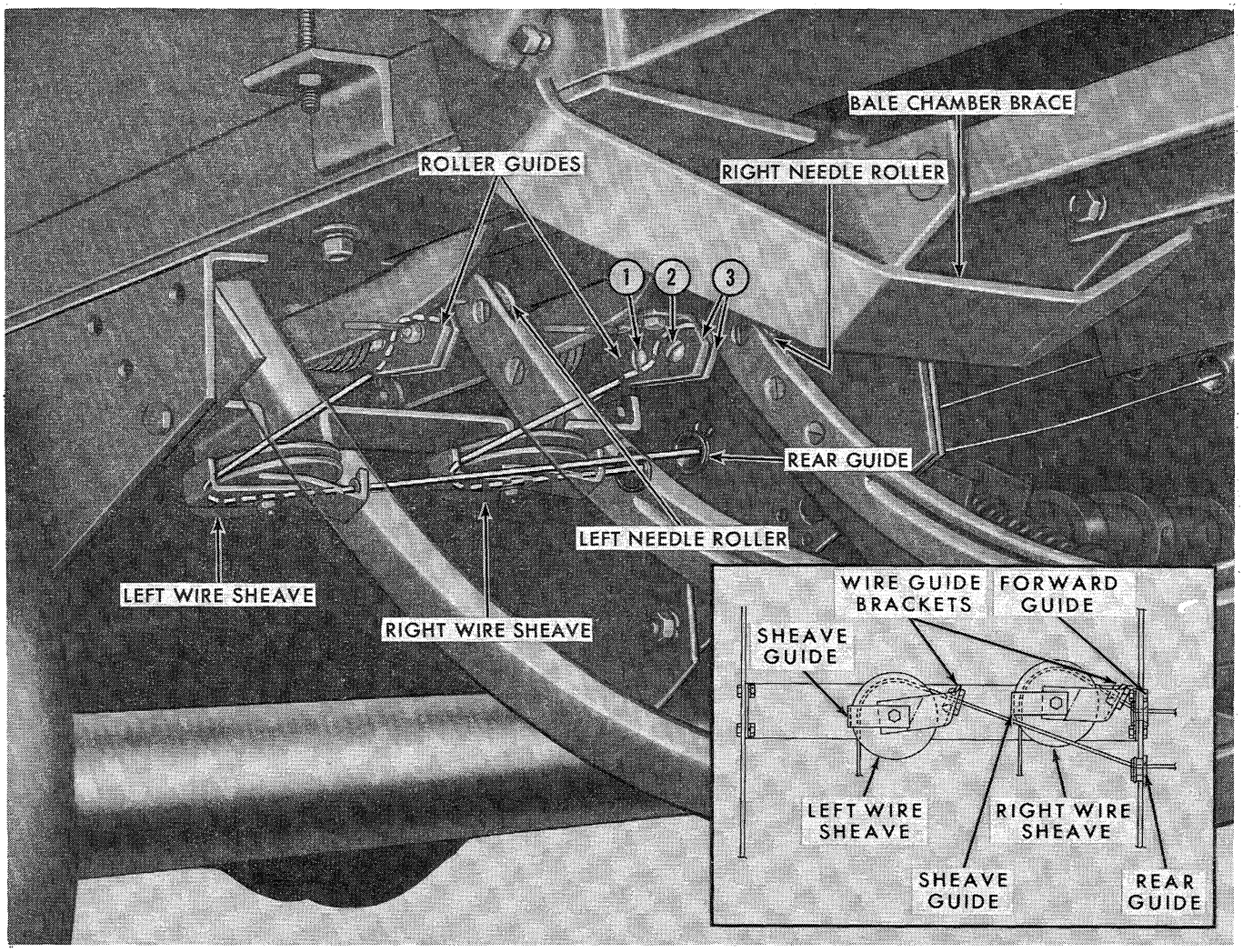


Figure 80
Threading the Needles

d. Thread the wire extending from the front guide container (3) wire through the guide in the right guide bracket and around the right wire sheave, roller guide, and right needle roller as in Steps a, b, and c. Secure the wire to the bale chamber brace.

NOTE: *If the needles are to be adjusted as outlined on page 39, do not secure the wires to the bale chamber brace until the adjustments have been completed.*

5. Check the wire guide brackets, Insert, Figure 80, to make certain they are positioned in line with their respective guides in the axle bracket. Also make certain that the sheave guides are positioned as close to the sheaves as possible without rubbing. Adjust if necessary.

6. Trip the wire twister clutch by rotating the metering wheel.

7. Turn the flywheel counterclockwise (facing the flywheel) until the wires are placed in the knife blocks and cut.

8. Remove the cut wires from the bale chamber brace, Figure 80, and the twisters, Figure 77.

WIRE TWISTER SHAFTS

The wire twister shafts, Figure 81, should be adjusted so that a 3/32" clearance exists between the right side of the twister finger shaft to the left edge of the needle slot. Perform the adjustment as follows:

1. Measure the 3/32" dimension, Figure 81, from the right side of the twister finger shaft to the left edge of the needle slot.

2. If the 3/32" dimension is not obtained, loosen the locking collars located next to each flanged bearing on the twister drive shaft. Move the entire assembly laterally by adjusting the slotted nut (2), Figure 84, at each end of the drive shaft. Then tighten the locking collars by driving them in the direction of shaft rotation. Tighten the set screw in each collar.

PROPER HEIGHT AND CLEARANCE OF NEEDLES

The function of the needles is to place the wire between the knives and knife blocks. The needles should be adjusted as close to the knife blocks as possible without interfering with the knife guards or wire twister shafts. The wire must be placed in the knife block before the twisters begin to turn. To obtain the correct needle height, adjust as follows:

NOTE: *The wire twister shafts should be checked and adjusted as outlined above, before proceeding with the needle adjustments.*

1. Trip the twister clutch by rotating the metering wheel.

2. Turn the flywheel counterclockwise (facing the flywheel) until the needles (without wires) are in the uppermost position as shown in Figure 83.

3. Check the 1/8" clearance between the needle rollers and the knife guards, Figure 83. Clearance can be reduced by loosening the rear needle clamp bolts and tightening the front bolts, or increased by loosening the front bolts and tightening the rear bolts.

4. Measure the 2-1/2" dimension between the rear edges of the twister shafts and the centers of the needle roller screws, Figure 83. Necessary adjustments can be made by detaching the needle adjusting clevis and lengthening or shortening the rod as required.

5. A 1/16" clearance should be maintained between the needles and the twister drive shafts, Figure 83. The correct clearance can be established by loosening the needle clamp bolts and sliding the needles laterally on the needle yoke.

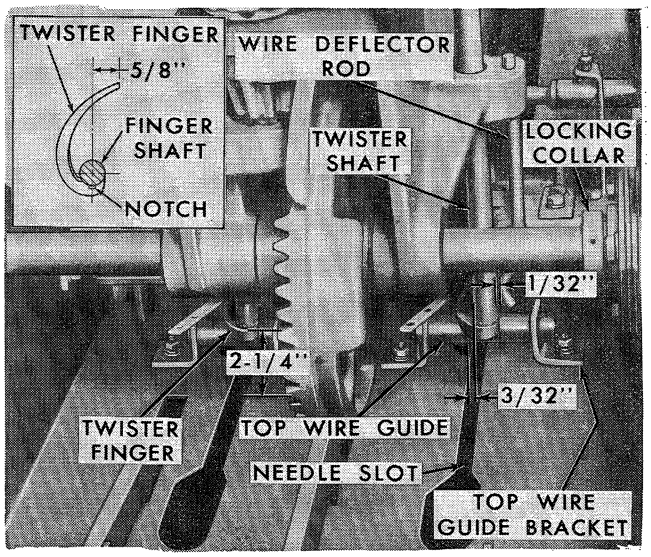


Figure 81
Twister Adjustment

After adjusting the needles, adjust the roller guides, as outlined below, so that the guides align with the needle rollers.

ROLLER GUIDES AND SHEAVE GUIDES

After checking the adjusting the needles, check the roller guides, Figure 80, on the underside of the bale chamber to determine if they align with the needle rollers. Adjust, if necessary, by loosening the roller guide mounting bolts and repositioning the roller guides as required. Then tighten the mounting bolts.

Check the wire guide brackets, Insert, Figure 80, to make certain they are positioned in line with their respective guides in the axle bracket. Also check the sheave guides to make certain that they are positioned as close to the sheaves as possible without rubbing.

The wire guide brackets and sheave guides may be adjusted by loosening the sheave mounting bolts and repositioning the wire guide brackets and sheave guides as required. Then tighten the sheave mounting bolts.

WIRE TWISTER FINGERS

The twister fingers should be set so that there is 2-1/4" between the tops of the fingers and the bale chamber. The notches in the fingers should align with the needle slots. The fingers can be adjusted as follows:

TWISTER ADJUSTMENT

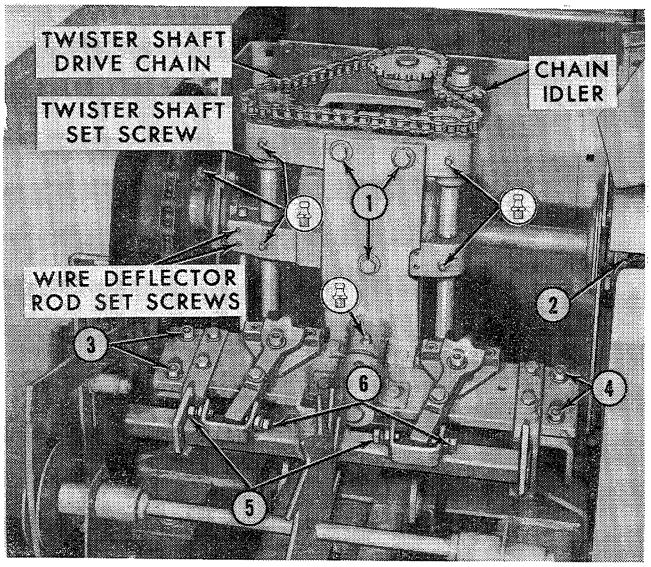


Figure 82
Twister Adjustment and Lubrication Points

1. Measure the 2-1/4" dimension between the top of the twister finger and the top of the bale chamber as shown in Figure 81. Then measure the 5/8" distance from the center line of the finger shaft to the tip of the finger point as shown in the Insert. The notches in the fingers should align with the needle slots.

2. If either dimension is incorrect, loosen the twister shaft set screw, Figure 82, on each shaft and raise or lower the shafts as required to obtain the 2-1/4" dimension. Then obtain the 5/8" dimension by rotating the shafts so that the points of the fingers are pointing to the rear of the bale chamber and the notches in the fingers align with the needle slots.

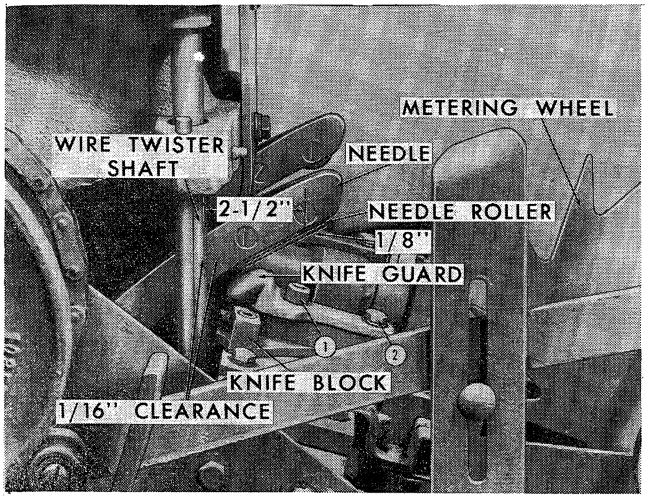


Figure 83
Needle Height and Clearance

TOP WIRE GUIDES

A 1/2" clearance should be maintained between the forward edges of the top wire guides and the rear edges of the twister shafts, Figure 81. Adjust the guides as follows:

1. Measure the distance between the forward edges of the top wire guides, Figure 81, and the rear edges of the twister shafts to determine if a 1/2" clearance is maintained.

2. Adjust the guides, if necessary, by loosening the bolts retaining the top wire guide brackets. Then move the brackets forward or rearward as required, and retighten the brackets.

WIRE DEFLECTOR RODS

The wire deflector rods, Figure 81, should be positioned so that a 1/4" clearance is maintained between the bottom of the rods and the top of the twister fingers. A 1/32" clearance should be maintained between the rods and twister shafts. The adjustment can be obtained as follows:

1. Measure the distance between the top surface of the twister fingers and the bottom of the deflector rods. A 1/4" clearance should exist. Rotate the rods, if necessary, and measure the 1/32" dimension, Figure 81, between the rods and the twister shafts.

2. Adjust the dimensions, as required, by removing the wire deflector set screws, Figure 82, and moving the rods. Then tighten the set screws.

TWISTER SHAFT DRIVE CHAIN

The twister shaft drive chain should be checked and adjusted as follows:

1. Check the drive chain, Figure 82, by rotating the drive sprocket until the chain is at its tightest point. A slight flexing of the slack strand should exist.

2. If necessary, loosen the nut on the chain idler and reposition the idler to obtain a slight flexing of the slack strand. Then tighten the nut on the chain idler.

KNIFE TO BLOCK

The knives are actuated by the cam and roller driven shuttle bar, Figure 82. With each cycle of the twisters, the shuttle bar is shifted laterally. This brings the knife adjusting bolts (5) or (6), into contact with the knives, moving the knives to the opposite side of the knife blocks.

The knife adjusting bolts should be set so that the wires will not slip from between the knives and knife blocks while the bale is being formed. Check the knife adjustment (without wire in the needles) as follows:

1. Place a short piece of wire between the knife and the left-hand side of each knife block, Figure 84.

2. Turn the flywheel counterclockwise (facing the flywheel) and cycle the twister until the knives crimp, cut, and release the wire.

3. Remove the wire and compare the crimp to that of the middle wire shown in Figure 85.

4. If adjustment is necessary, back off the jam nuts on the knife adjusting bolts (5), Figure 82. and adjust the bolts so that the wire will not slip from between the knife and knife blocks, then tighten the jam nuts.

5. Repeat the procedure with a short piece of wire placed between the knife and the right-hand side of the knife block. If required, adjust the knives in the right-hand position with the knife adjusting bolts at (6), Figure 82.'

KNIFE GUARDS

The knife guards, Figure 83, should align with the ends of the knives. Knife guard adjustment is made as follows:

1. Check each knife guard, Figure 83, to make sure the front points of the guards align with the front points of the knives and that both knives rotate freely without vertical play.

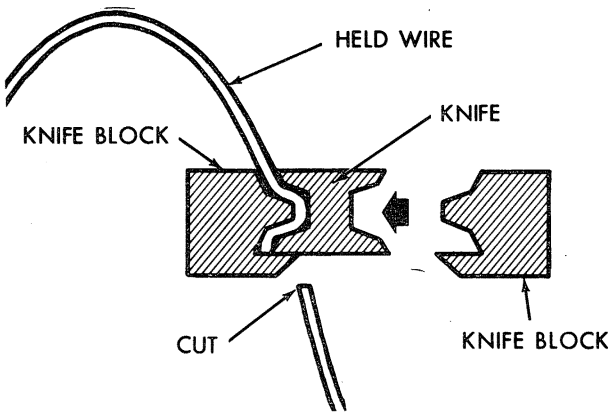


Figure 84
Knife Clearance

2. Adjust the knife guards by loosening the bolts, (1) and (2), Figure 83, and aligning the guards with the end of the knives. Then tighten the adjusting bolts (1) and (2). Back off the adjusting bolt (1), until the knives pivot freely without vertical play, and lock the bolt with the jam nut.

RING GEAR AND PINION

A 0.00''–0.030'' clearance should be maintained between the flat of the ring gear and the flat of the pinion, Figure 88.

1. Check the 0.00''–0.030'' clearance between the flat of the ring gear and the flat of the pinion,

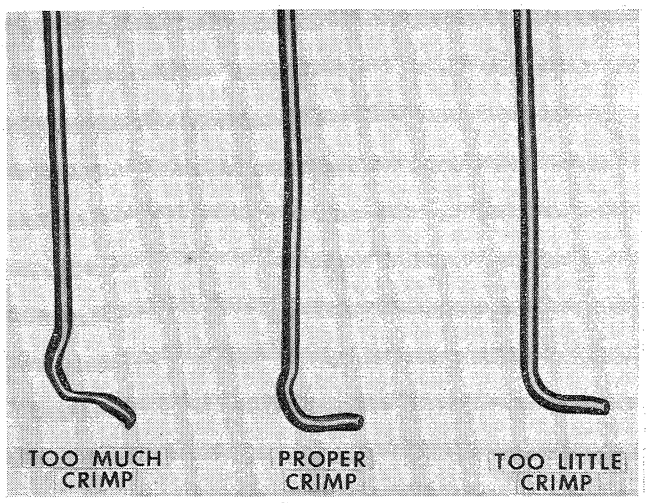


Figure 85
Comparing the Wire Crimp

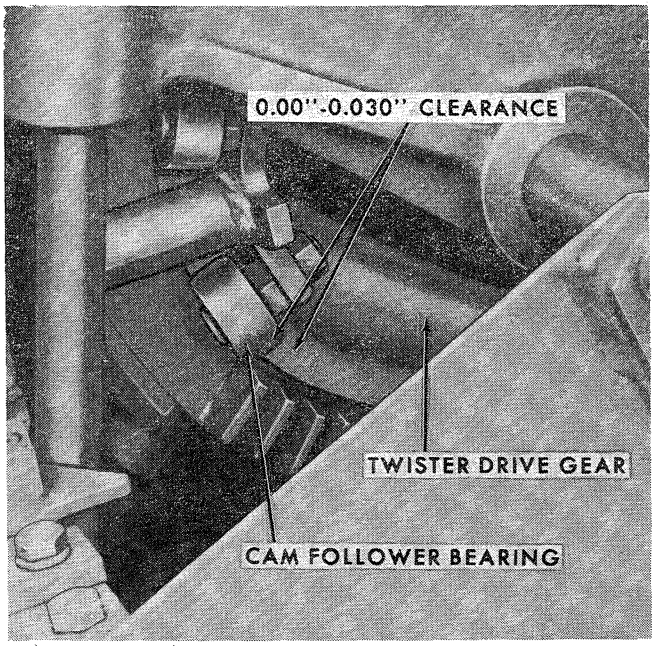


Figure 86
Pinion and Ring Gear Adjustment

Figure 86. If the dimension is not correct, install shims on the tooth side of the gear to increase clearance, or on the back side to decrease clearance. The adjustment can be made by transferring existing ring gear shims from one side of the gear to the other.

2. After obtaining the 0.00" – 0.030" clearance, check the ring gear-to-pinion backlash. A backlash of 0.01" – 0.06" should be established. Add or remove shims as required to obtain this dimension.

3. Cycle the twister mechanism by rotating the flywheel and check the cam follower bearing clearance as outlined below.

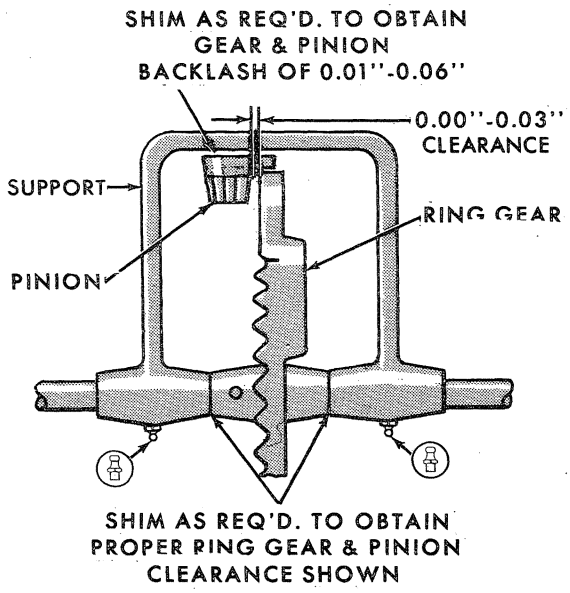


Figure 87
Cam Follower Bearing Clearance

CAM FOLLOWER BEARING

A 0.00"–0.030" clearance should exist between the flat face of the twister drive gear and the cam follower bearing, Figure 87. Check and adjust the dimension as follows:

1. Measure the clearance between the flat face of the twister drive gear and the cam follower bearing, Figure 87. A 0.00"–0.030" clearance should exist.

2. If necessary, obtain the dimension by loosening the bolts at (1), (3), and (4), Figure 82, and sliding the mounting platform laterally as required.

TROUBLE SHOOTING

The following information is presented to aid the operator in quickly recognizing operational problems, their general cause and the remedy:

GENERAL TROUBLE SHOOTING

Problem	Possible Cause	Remedy
CLUTCH OPERATES EXCESSIVELY	1. Foreign object in hay.	1. Remove object from hay.
	2. Dull cutting knives.	2. Sharpen knives.
	3. Knives out of adjustment.	3. Adjust knives.
	4. Bale tension too great.	4. Decrease bale tension.
	5. Needles out of time.	5. Time needles.
FAILURE TO PICK UP HAY THOROUGHLY	1. Hay not properly raked.	1. Rake hay in same direction hay was cut.
	2. Not traveling direction of mower and rake.	2. Travel direction of mower and rake.
	3. Excessive ground speed.	3. Decrease ground speed.
	4. Pick-up too high off ground.	4. Lower pick-up slightly and check pick-up spring tension.
	5. Broken or bent pick-up fingers.	5. Replace or straighten fingers.
MISSHAPED BALES	1. Bale short on right side.	1. Adjust feed fork for less penetration.
	2. Bale short on left side.	2. Adjust feed fork for more penetration; install feed baffle; and/or adjust feed platform access door.
	3. Bale soft or light on top.	3. Increase size of windrow, increase ground speed; increase bale tension; install feed baffle; and/or adjust feed platform access door.
	4. Dull cutting knives.	4. Sharpen knives.
	5. Knives out of adjustment.	5. Adjust knife clearance.
	6. Bale too light.	6. Increase bale tension or add bale wedges.
BROKEN NEEDLES	1. Needles out of time.	1. Time needles.
	2. Needle slots in plunger plugged.	2. Clean out needle slots.
	3. Needles striking frame or plunger.	3. Adjust needles.
	4. Needles loose on yoke.	4. Adjust and tighten needles.
	5. Needles out of adjustment.	5. Adjust needles.

KNOTTER TROUBLE SHOOTING

Problem	Possible Cause	Remedy
KNOTS HANGING ON BILL HOOK	1. Stripper not operating.	1. Adjust stripper.
	2. Too much tension on bill hook.	2. Decrease tension on bill hook.
KNOT TIED, BUT LOOP IN END OF TWINE – BOTH ENDS SAME LENGTH	1. Too little tension on bill hook.	1. Increase tension on bill hook.
	2. Worn bill hook.	2. Replace bill hook.

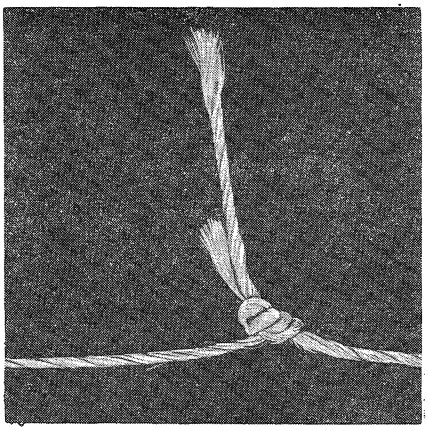


Figure 88

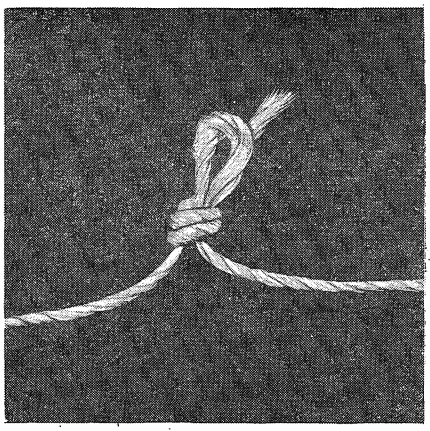


Figure 89
Improperly Tied Knots

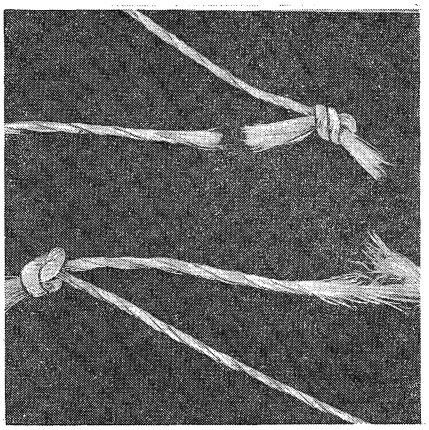


Figure 90

KNOTTER TROUBLE SHOOTING (Cont.)

Problem	Possible Cause	Remedy
KNOT TIED, BUT LOOP IN ONE END OF TWINE – ONE END LONGER THAN OTHER (See Figures 88 and 89)	1. Too little tension on twine holder. 2. Dull twine knife. 3. Worn twine disc and holder. 4. Excessive bale tension. 5. Excessive twine bracket tension.	1. Increase tension on twine holder. 2. Sharpen twine knife. 3. Replace twine disc and holder. 4. Reduce bale tension. 5. Reduce twine bracket tension.
KNOT IN FRONT STRAND ONLY	1. Too little tension on twine holder. 2. Bale tension too great. 3. Twine bracket tension too great. 4. Twine disc and holder worn.	1. Increase tension on twine holder. 2. Decrease bale tension. 3. Decrease twine bracket tension. 4. Replace twine disc and holder.
KNOT IN TOP STRAND ONLY	1. Improper needle adjustment. 2. Improper twine finger adjustment. 3. Hay collecting under dogs. 4. Broken or weak dog springs. 5. Too little twine bracket tension.	1. Adjust needles. 2. Adjust twine fingers. 3. Remove hay. 4. Replace dog springs. 5. Increase twine bracket tension.
NO KNOT IN EITHER END OF TWINE – LOOSELY TIED KNOT	1. Too little tension on bill hook. 2. Worn bill hook. 3. Excessive twine holder tension.	1. Increase tension on bill hook. 2. Replace bill hook. 3. Reduce twine holder tension.
TWINE BREAKING IN KNOT	1. Excessive clearance between stripper flange and heel of bill hook. 2. Too much tension on twine holder.	1. Adjust stripper. 2. Decrease tension on twine holder.
TWINE FRAYED NEAR KNOT (See Figure 90)	1. At ½" – Rough stripper arm. 2. At 1¾" – Rough twine finger. 3. At 2½" – Rough top needle slot. 4. At 16-18" – Rough bottom needle slot.	1. Smooth up stripper arm. 2. Smooth up twine finger. 3. Smooth up top needle slot. 4. Smooth up bottom needle slot.

KNOTTER TROUBLE SHOOTING (Cont.)

Problem	Possible Cause	Remedy
TWINE ON MISTIED BALE OR BALES TIED TO KNOT OF PREVIOUS BALE	1. Twine not picked up by twine disc because:	
	a. Excessive needle to twine disc clearance.	a. Adjust needles.
	b. Twine disc out of time.	b. Time twine disc.
TWINE DISC DOES NOT STAY IN TIME	1. Worn gears.	1. Replace gears if badly worn.
	2. Twine disc pinion sheared or worn.	2. Replace pinion.
	3. Worm slips on tapered shaft.	3. Tighten nut if loose or replace shaft or gear.

TWISTER TROUBLE SHOOTING

Problem	Possible Cause	Remedy
NO WIRE AROUND BALE	1. Wire tangled in container.	1. Replace wire coil.
	2. Excessive resistance on wire.	2. Remove kinks from wire, replace worn wire guides; rethread wire properly.
	3. Wire broken.	3. Rethread the wire.
	4. Needles miss wire.	4. Adjust needles; adjust roller guides.
WIRE CUT BUT NOT HELD	1. Insufficient knife tension.	1. Adjust knife to block.
	2. Excessive knife tension.	2. Adjust knife to block.
	3. Hay dogs not functioning.	3. Adjust spring tension.
WIRE BREAKS AFTER TWIST IS MADE.	1. Excessive bale tension.	1. Reduce bale tension.
	2. Twist too tight.	2. Raise twister finger.
INSUFFICIENT TWISTS ON WIRE	1. Deflector rod out of adjustment.	1. Adjust deflector rod.
BROKEN TWISTER FINGERS	1. Needles loose on yoke.	1. Adjust and tighten needles.
	2. Needles out of adjustment.	2. Adjust needles.
BROKEN WIRE OR TWIST PULLED APART	1. Offset edges of needle slots grooved.	1. File smooth.
POOR TWIST—ONE WIRE STRAIGHT IN TWIST	1. Twister height too low.	1. Increase twister height.
	2. Top guide not properly located.	2. Adjust top guide to increase wire angles.

LUBRICATION

Under normal conditions, the baler should be lubricated weekly or after every 2500 bales. Under extremely dusty conditions, the baler should be lubricated more often.

Follow the sequence of numbers in the Lubrication Chart, Figure 91, to help simplify the procedure. If your baler is equipped with a twister mechanism, lubricate the twister through the six lubrication fittings shown in Figure 82, the two lubrication fittings on the twister support frame shown in Figure 86, and the two lubrication fittings on the twister drive pinion shaft.

Additional lubrication is required on the baler as follows:

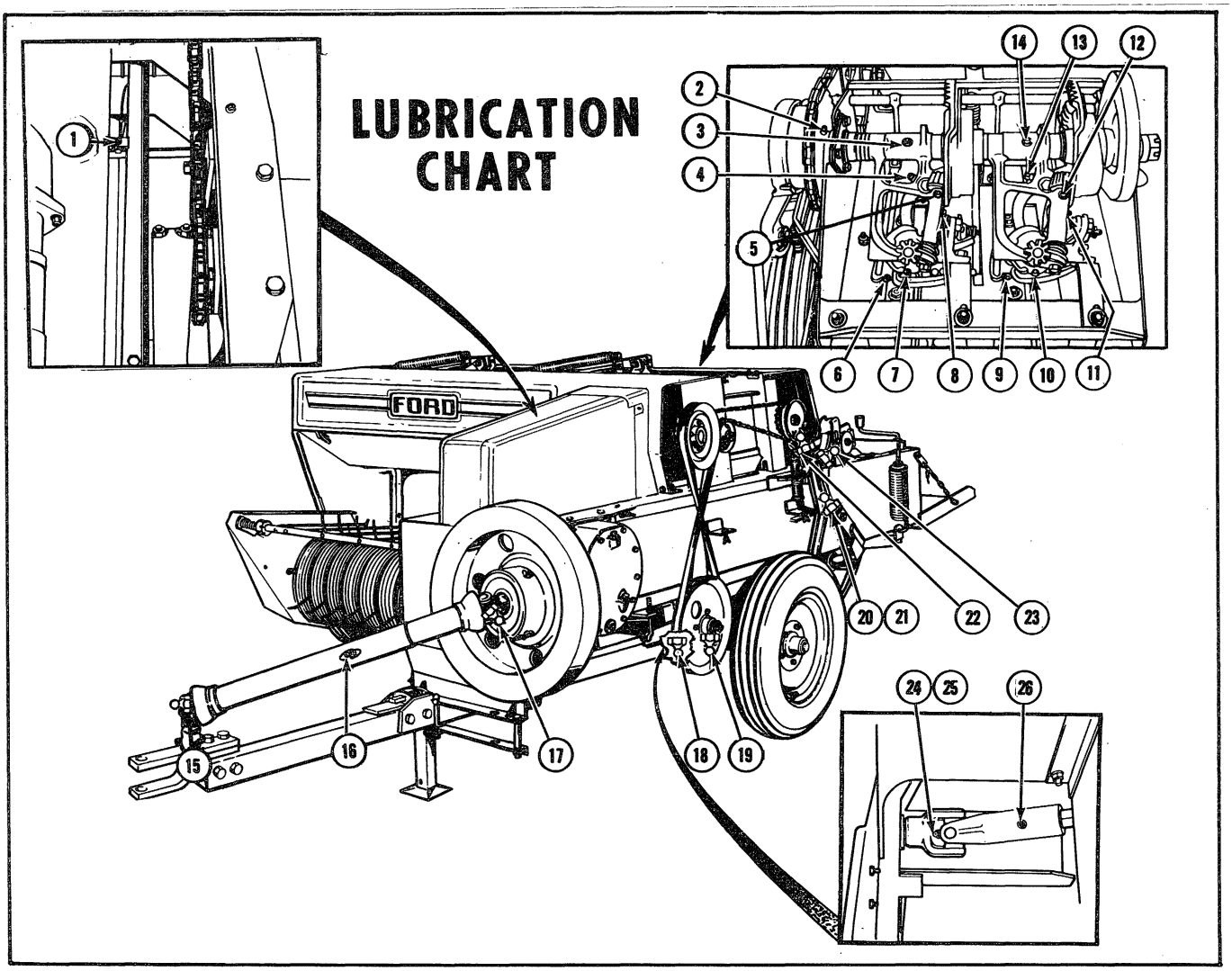


Figure 91
Lubrication Chart

KEY TO LUBRICATION CHART

1. Plunger Connecting Rod, Wrist Pin
2. Clutch Drive Sprocket
3. Left Knotter Housing
4. Left Knife Arm Bearing
5. Left Worm Gear Shaft Bearing
6. Left Twine Finger
7. Left Twine Disc Bearing
8. Left Bill Hook Bearing
9. Right Twine Finger
10. Right Twine Disc Bearing
11. Right Bill Hook Bearing
12. Right Worm Gear Shaft Bearing
13. Right Knife Arm Bearing
14. Right Knotter Housing
15. P.T.O. Drive Universal, Front
16. P.T.O. Drive Shaft Sheave
17. P.T.O. Drive Universal, Rear
18. Pick-up Countershaft
19. Pick-up Drive Reverse Clutch
20. Needle Yoke Bearing, Left
21. Needle Yoke Bearing, Right
22. Knotter Clutch Arm
23. Knotter Clutch Bellcrank
24. Pick-up Drive Universal Joint, Right
25. Pick-up Drive Universal Joint, Left
26. Pick-up Drive Shaft Sheave

1. Periodically check the oil level in the feed fork drive box, Figure 29. The oil level should be maintained even with the level plug hole. Add 90 E.P. oil as required, being careful not to overfill.

2. Keep the main gear box, Figure 92, filled to the oil level plug hole with 140 E.P. oil (Hypoid Lube).

3. Clean and repack the wheel bearings yearly.

4. Keep the P.T.O. drive shaft and telescoping shield well lubricated to prevent binding.

MAINTENANCE

Regular attention to the maintenance of your hay baler will pay dividends in maximum baler efficiency and longer life.

Keep the baler as clean as possible, paying particular attention to the tying mechanism. Accumulated chaff and material should be removed daily or oftener, if necessary, when baling under extremely dusty conditions. Inspect the plunger rollers and guides periodically for accumulated buildup of trash and clean if necessary. Inspect the baler for loose nuts and bolts, proper V-belt and chain tension, and worn or broken parts. Oil the roller chains frequently and keep the chains tight, but do not overload bearings. Replace worn or broken parts promptly.

WHEELS AND TIRES

Check the tire pressure at frequent intervals during the baling season. The inflation pressures for the various size tires are as follows:

Right-Hand Tires	*Inflation Pressure*
5.00 x 15	26
6.40 x 15	20

Left-Hand Tires	*Inflation Pressure*
6.70 x 15	42
9.50 x 14	26

The wheels run on tapered roller bearings which should be cleaned and repacked with bearing grease once a year. When installing the wheel, tighten the castellated nut until a slight drag is felt turning the wheel. Back off the nut until the nearest slot in the nut is aligned with the hole in the spindle. Install the cotter pin and hub cap.

MAIN GEAR BOX

Keep the gear box filled to the level plug with SAE 140 E.P. oil (Hypoid Lube). Change the oil and clean the drain plug and vent plug seasonally. See Figure 92.

Check the gear box mounting bolts periodically, and tighten if necessary.

FEED FORK DRIVE BOX

Check the grease in the feed fork drive box, Figure 29, by removing the oil level plug. The grease level should be level with the bottom of the hole. Add ESEN M1C137A through the filler plug opening as required. Do not overfill.

KNIVES

Check the plunger and stationary knives to be sure that there is 1/32" to 3/32" clearance between the knives. See Figure 37.

Remove and sharpen the knives at frequent intervals to obtain a clean cut. When grinding, be sure to maintain the original bevel on the knives.

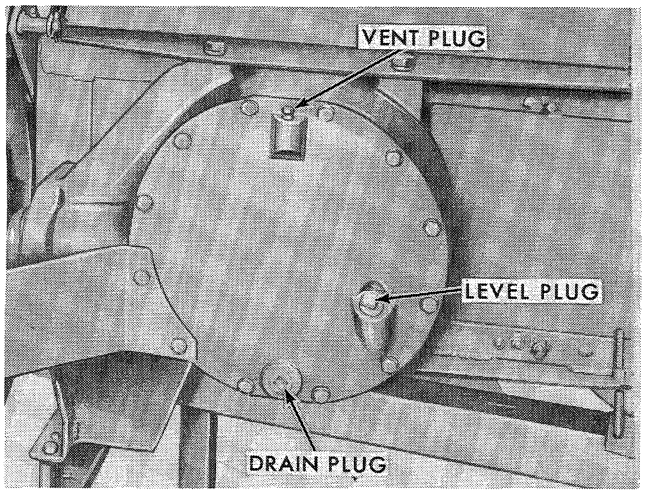


Figure 92
Main Gear Box

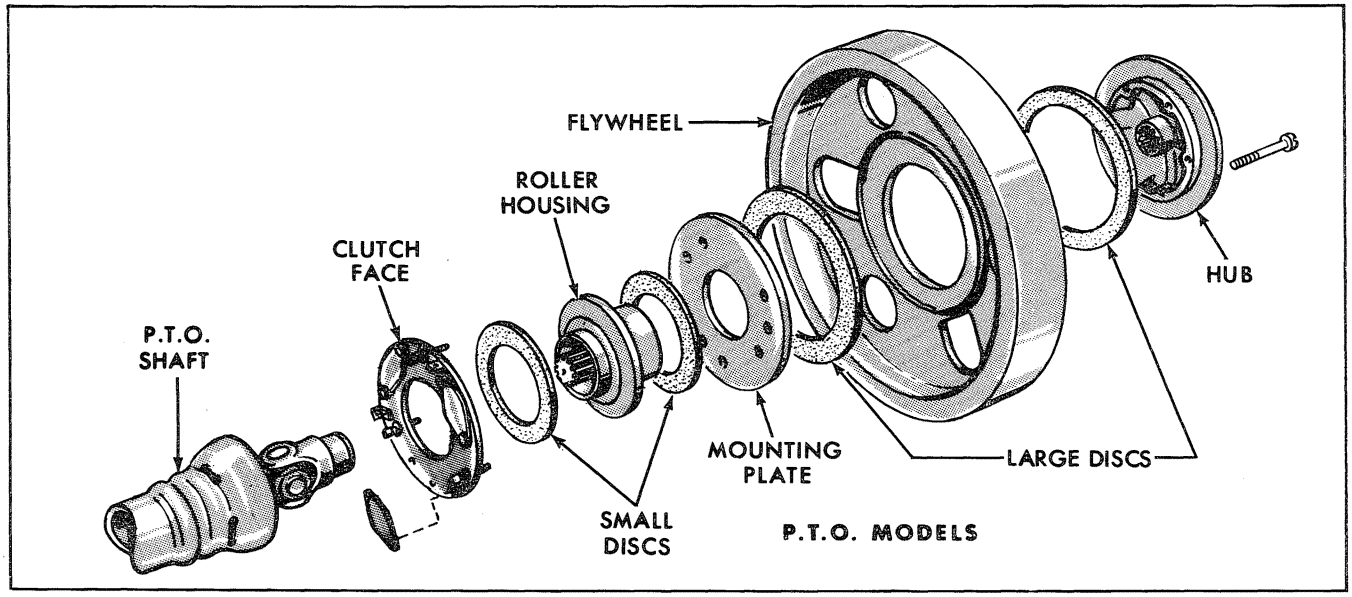


Figure 93
Clutch Components

CLUTCH DISCS

P.T.O. Models: In the event that it is necessary to replace the clutch discs, refer to Figure 93, and proceed as follows:

1. Remove the shield, leaf springs, washers, and clutch retaining bolts from the assembly.
2. Remove the roller housing, the inner small clutch disc, and clutch mounting plate.
3. Slide the flywheel off the clutch hub and remove the large inner and outer clutch discs.
4. Remove the rear half of the P.T.O. shield by depressing the locking lugs. Slide the clutch face and disc over the drive shaft.
5. Replace needed discs and reassemble in the reverse order of removal.

PICK-UP ASSEMBLY

The pick-up assembly should be inspected at frequent intervals for bent or broken teeth. The pick-up teeth are either spring coiled or rubber mounted.

Damaged spring teeth are easily replaced as follows:

1. Remove the hay hold-down assembly from the pick-up, if desired.
2. Remove the reel band covering the damaged spring tooth by removing the four hex head bolts in the band.
3. Remove the lock washer and nut (2), Figure 94, and the clamp (3), then replace the damaged spring tooth with a new assembly (1). Secure with a clamp (3), and lock washer and nut (2).

Damaged rubber mounted pick-up teeth are replaced as follows:

1. Remove the hay hold-down assembly from the front of the pick-up, if desired.
2. Remove the reel band covering the damaged pick-up tooth by removing the four hex head bolts in the band.
3. Remove the lock washer and nut (2), Figure 95, from the hex head bolt and remove the damaged tooth. Replace the damaged rubber mounted tooth with a new tooth (1). Secure the tooth to the pick-up bar with the previously removed hex head bolt, lock washer and nut (2).

KNOTTER ASSEMBLY

Performing preventitive maintenance on the knotter assembly will help maintain trouble-free operation during the entire baling season. Periodically check the machined surface on the cam gears, bill hook pinions, and twine disc pinions for wear. Also check the cam gears and knotter assemblies for excessive

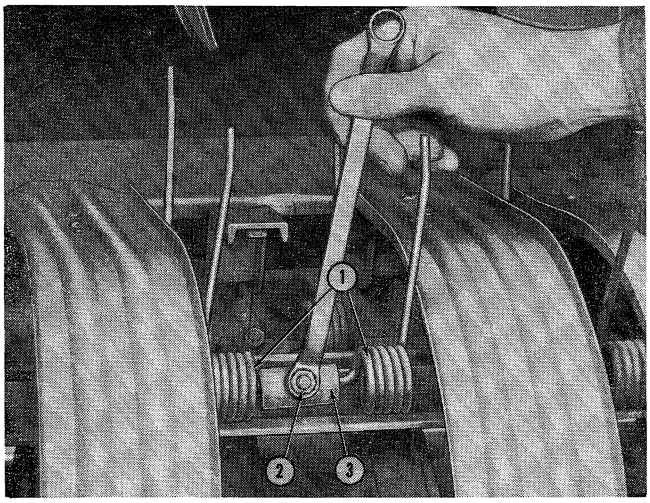


Figure 94
Replacing Spring Coiled Pick-Up Teeth

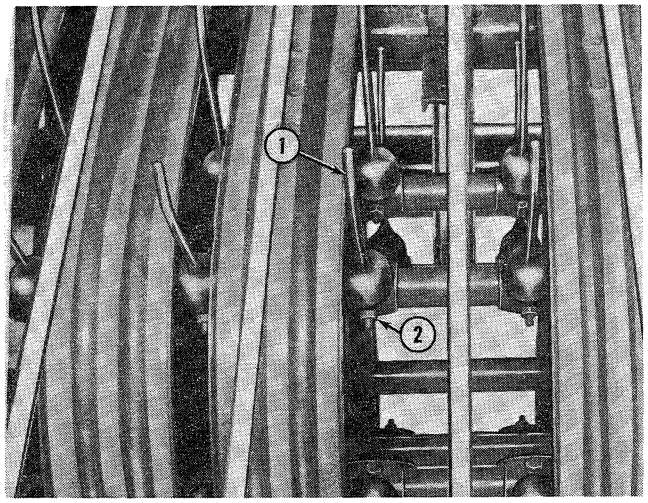


Figure 95
Replacing Rubber Mounted Pick-Up Teeth

end play on the knotter shaft, and the cleaner plates for free floating action in the twine discs.

CHECKING THE KNOTTER STACK

End play among the components assembled on the knotter shaft is determined by measuring the clearance between the bill hook pinion and cam gear on each knotter assembly. After extensive use, the bill hook-to-cam gear clearances should be checked, and if necessary, adjusted. Excessive end play will accelerate wear, and if not corrected, can result in breakage of knotter parts. When the combined bill hook pinion-to-cam gear clearance for both knotter assemblies exceeds .045" due to wear, the knotter stack should be adjusted to obtain a combined clearance of .007" – .021".

Check the knotter stack clearances as follows:

1. Remove the knotter frame mounting bolts and pivot the knotter frames upward.

2. Check the components on the knotter shaft to make sure they are free to move laterally.

3. Insert a screwdriver or other appropriate tool at point "A", Figure 96. Apply lateral pressure with the screwdriver and spread the left-hand knotter cam gear until the flat of the right-hand bill hook pinion contacts the machined face of the right-hand knotter cam gear.

   NOTE: *Removing the clearance between the right-hand bill hook pinion and cam gear will permit the combined bill hook-to-cam gear clearance to be measured on the left-hand knotter assembly.*

4. While maintaining slight lateral pressure with the screwdriver or other tool, measure the distance between the flat of the left-hand bill hook pinion and the machined face of the knotter cam gear at locations (1), (2), and (3), Figure 96. The dimensions represent the combined bill hook-to-cam gear clearances for both knotter assemblies and should not be less than .007" nor more than .021" at any of the three locations.

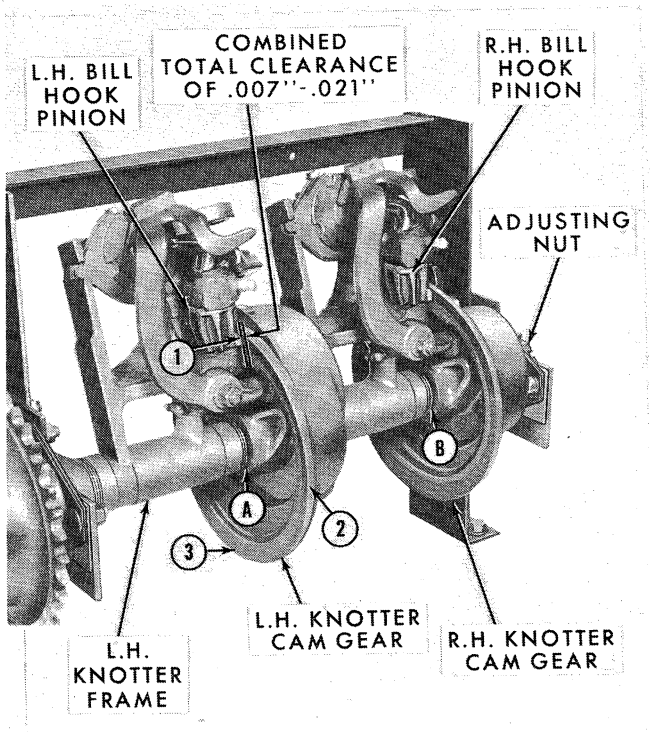


Figure 96
Bill Hook-to-Cam Gear Clearance
(Knotter Shown Assembled on Workbench Stand For Illustration Purposes)

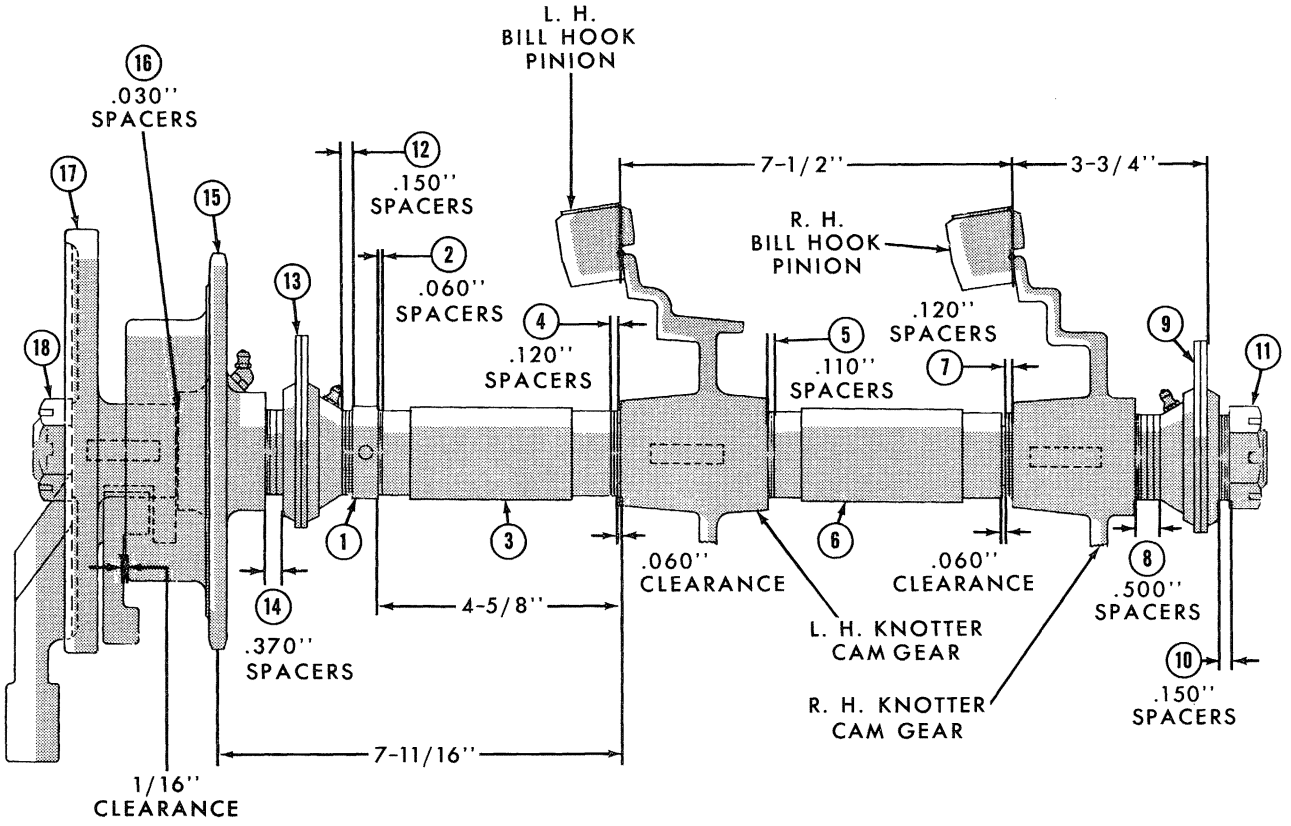


Figure 97
Knotter Assembly Stack Up Dimensions

NOTE: *It may be necessary to rotate the knotter cam gears to obtain the three measurements. To rotate the gears, disconnect the needle yoke drive rod from the needle yoke assembly and manually rotate the knotter clutch arm until the cam gear is in the required position.*

5. Repeat the check on the right-hand knotter assembly inserting the screwdriver or other tool at point "B", Figure 96. Spread the right-hand knotter frame from the right-hand knotter cam gear until the left-hand knotter cam gear contacts the flat of the left-hand bill hook pinion. The dimensions should be the same as those taken on the left-hand knotter assembly.

NOTE: *Removing the clearance between the left-hand knotter cam gear and bill hook pinion will permit the combined bill hook-to-cam gear clearance to be measured on the right-hand knotter assembly.*

6. If the measurements taken on the knotter assemblies are in excess of .021", remove the cotter pin from the adjusting nut, Figure 96, and tighten as necessary to obtain the required .007" – .021" clearance. .Each slot of the nut will increase or decrease the clearance by .014". Reinstall the cotter pin through the nut and shaft.

IMPORTANT: *Do not turn the adjusting nut more than finger tight. Excessive tightening may cause binding between the cam gears and bill hook pinions, resulting in premature wear. If a total bill hook pinion-to-cam gear clearance of .007" – .021" cannot be obtained by means of the adjusting nut, it may be necessary to remove one or more of the spacers at points "A" and/or "B", Figure 96, to enable the cam gears to be adjusted to the bill hook pinions. This will require removing the knotter assembly from the baler and restacking it as outlined in the procedure below.*

RESTACKING THE KNOTTER ASSEMBLY

If the knotter assembly cannot be adjusted by means of the adjusting nut or requires new parts, remove the assembly from the baler and disassemble it. Then

reassemble and install it per the following procedure and in the order listed. Doing so will prevent time consuming trial and error assembly methods. Refer to Figures 97 and 98 during the assembly procedure.

1. Install the locking collar (1), Figure 97, on the knotter shaft by installing the rolled pin through the collar and shaft.

2. Working from left to right, install approximately .060" spacers (2), on the shaft, then install the left-hand knotter frame assembly (3).

3. Install 0.120" spacers (4), on the shaft, then install the key and the left-hand knotter cam gear. Make certain the gear slides freely over the key. The gear must be free to move laterally when all of the components are assembled on the knotter shaft.

4. Slide the cam gear to the left so that the machined face of the gear contacts the flat of the left-hand bill hook pinion. Measure the 4-5/8" dimension from the face of the collar to the hub of the left-hand knotter cam gear. A tolerance of plus or minus 1/32" is permissable. If necessary, add or remove the knotter spacers (2), to obtain the 4-5/8" dimension.

NOTE: *A clearance of up to 0.060" should exist between the spacers (4), and the cam gear when the gear is moved against the flat of the bill hook pinion.*

5. Continue assembling the components on the knotter shaft by installing approximately 0.110" spacers (5), and the right-hand knotter frame assembly (6).

6. Install .120" spacers (7), on the shaft, then install the key and the right-hand knotter cam gear. Make certain the gear slides freely over the key. The cam gear must be free to move laterally when all components are assembled on the shaft.

7. Slide the right-hand knotter cam gear to the left so that the machined surface of the gear contacts the flat of the right-hand bill hook pinion. Measure the 7-1/2" dimension between the two machined surfaces on the knotter cam gears. A tolerance of plus or minus 1/32" is permissable. If necessary, add or remove knotter spacers (5) to obtain the 7-1/2" dimension.

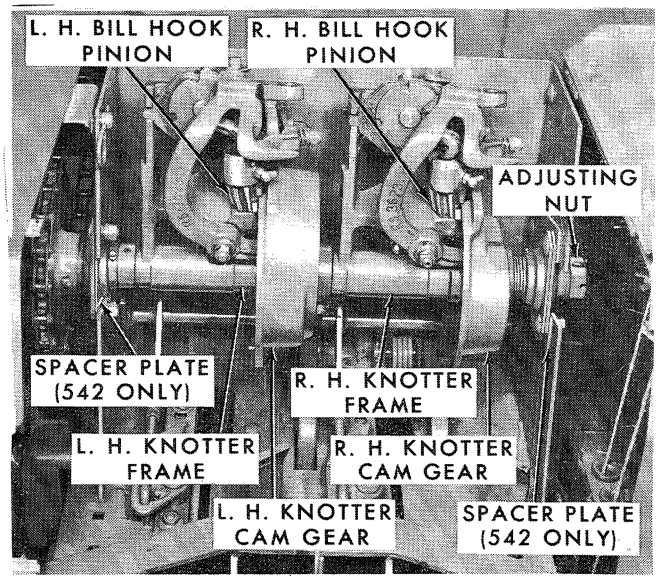


Figure 98
Knotter Assembly Installed

NOTE: *A clearance of up to 0.060" should exist between the spacers (7), and the cam gear when the cam gear is moved against the flat of the bill hook pinon.*

8. Install approximately 0.500" spacers (8), the right-hand flanged bearing assembly (9) (with mounting bolts installed), 0.150" spacers (10), and the adjusting nut (11). Tighten the nut to remove any end play in the knotter stack, then back it off until the bearing is allowed to rotate freely. Do not install the cotter pin at this time.

9. Check the alignment of the bearing flanges by spinning the bearing. Adjust the flanges to run as true as possible.

10. With a square or other straight edge positioned as shown in Figure 99, measure the distance between the machined surface of the right-hand knotter cam gear and the outer surface of the right-hand (flanged bearing assembly..The measurement should be 3-3/4" plus or minus 1/32". Add or remove spacers (8), as required to obtain the dimension.

11. Tighten the adjusting nut (11), Figure 97, to remove all end play in the knotter stack, then loosen the nut 1/12 to 3/12 of a turn and install the cotter pin through the nut and shaft. If the cotter pin cannot be installed, it may be necessary to remove one or more of the spacers (10).

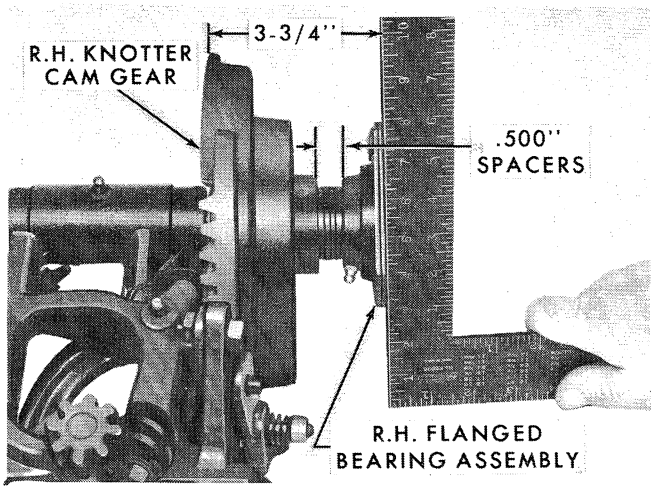


Figure 99
Cam Gear to Bearing Flange Measurement

12. Check the combined bill hook pinion-to-cam gear clearance for both knotter assemblies as outlined under "Checking the Knotter Stack," page 0 of this manual. The combined bill hook-to-cam gear clearance for both knotter assemblies must not be less than .007" nor more than .021". Adjust if necessary.

13. Install .150" spacers (12), Figure 97, next to the collar (1), then slide the left-hand flanged bearing assembly (13) on the shaft.

14. Position the assembled knotter shaft between the the knotter housing side plates, Figure 98. Bolt the flange of each bearing to the left-hand side of the plates as shown.

    IMPORTANT: Series 542 Hay Balers Only: *Be sure to install the 0.100" spacer plates between the bearing flanges and the knotter housing plates as shown in Figure 98. The plates compensate for the variance between the Series 532 and Series 542 bale chamber widths.*

15. Install approximately 0.370" spacers (14), Figure 97, on the knotter shaft, then install the clutch sprocket (15).

16. Measure the 7-11/16" dimension between the machined surface of the left-hand knotter cam gear and the center of the teeth on the clutch sprocket, while holding the sprocket against the spacers (14). The dimension is used to determine if the clutch sprocket is properly aligned with the drive sprocket. A tolerance of plus or minus 1/32" is acceptable. If necessary, remove the sprocket and add or remove spacers (14), as required to obtain the 7-11/16" dimension.

17. Install approximately 0.030" spacers (16), on the knotter shaft, then install the key and the knotter cam assembly (17).

18. With the cam assembly held against the spacers (16), check the 1/16" clearance between the edge of the clutch pawl and the clutch sprocket. If necessary, remove the cam assembly and add or remove the spacers (16), until the clearance is obtained.

19. Secure the parts on the shaft by installing the knotter shaft nut (18). Tighten the nut, then back it off until the sprocket assembly is allowed to revolve freely without binding. Install the cotter pin through the nut and shaft.

20. Recheck the bill hook pinion-to-cam gear clearances as outlined under "Checking the Knotter Stack," page 47, and adjust if required. When the knotter is properly assembled and adjusted, a combined clearance of 0.007" to 0.021" will exist between the bill hook pinions and cam gears.

21. Connect the needle yoke drive rod to the knotter cam arm.

22. If the twine finger activating lever assembly was removed during the knotter disassembly, install the assembly as follows:

    Series 532 Hay Balers: Install the assembly on the knotter housing side plates with two 3/8" – 16 x 1-1/4" carriage bolts, one .100" thick flat washer, and two 3/8" lock washers, spacers, and nuts. Be sure that the .100" thick flat washer is installed between the ***left-hand*** knotter side plate and the left-hand arm of the lever assembly. The lever assembly must swing freely without binding.

    Series 542 Heavy Duty Hay Balers: Install the assembly on the knotter housing side plates with two 3/8" – 16 x 1-1/4" carriage bolts, one .100" thick flat washer, and two 3/8" lock washers, spacers, and nuts. Be sure that the .100" thick flat washer is installed between the ***right-hand*** knotter side plate and the right-hand arm of the lever assembly. The lever assembly must swing freely without binding.

IMPORTANT: *After installing the twine finger activating lever assembly on the knotter housing, adjust the twine fingers as outlined on page 28.*

23. After completing the knotter stackup procedure, check the needles for proper height, clearance to the twine disc and twine holder, and for proper timing to the plunger as outlined in your operator's manual.

STORAGE

When the baler is not in use, it should be given adequate storage to help prevent the formation of rust. Excessive rust in the bale chamber and feed housing can cause poorly shaped bales. Rust on the knotter bill hooks and twine disc interfere with tying. The following recommendations are offered to aid the owner in storing the hay baler correctly:

1. Three set screws are provided for separating the clutch discs in storage to prevent them from adhering to the flywheel. Back off the six lock nuts (2), Figure 100, and tighten the screws (1), to separate the discs.

   NOTE: *Rotate the flywheel by hand when the baler is taken from storage to make certain that the clutch has not adhered to the flywheel. Before completely releasing the clutch plate, burnish the clutch as outlined on page 17 of the Adjustments Section of this manual.*

2. Release the tension on the bale tension bars and remove all hay from the chamber.

3. Clean the entire baler thoroughly. Special attention should be given the knotter or twister mechanism.

4. Operate the baler empty for a few minutes. Lubricate it thoroughly as directed in the section on "Lubrication".

5. Clean the chains thoroughly and apply a coat of motor oil to prevent rust.

6. Coat the knotter parts, the inside of the bale chamber, and the feed fork housing with a good grade of rust preventive or grease.

7. Use Ford Spray-Type Touch-Up Enamel where necessary on painted surfaces to prevent rust and maintain the appearance of the baler.

8. Make a complete list of badly worn or damaged parts and replace them while preparing the baler for storage.

9. Store the baler in a clean, dry place.

10. Block the baler up to take the weight off the tires; however, do not deflate the tires.

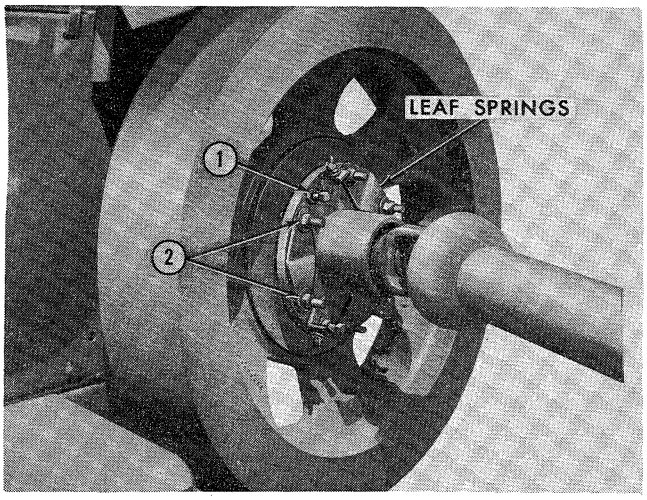


Figure 100
Clutch Disc

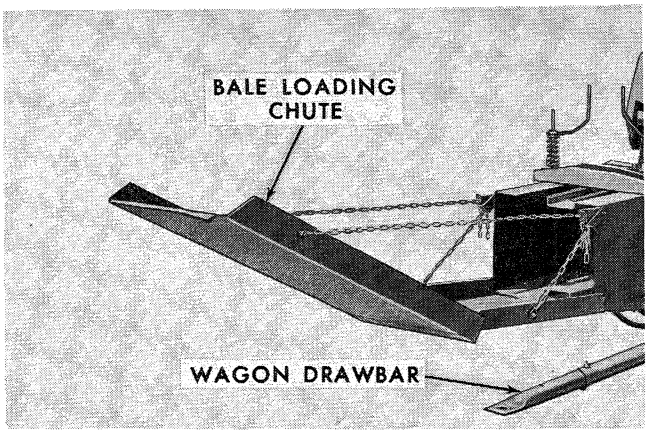


Figure 101
Bale Loading Chute and Wagon Hitch Kit Installed

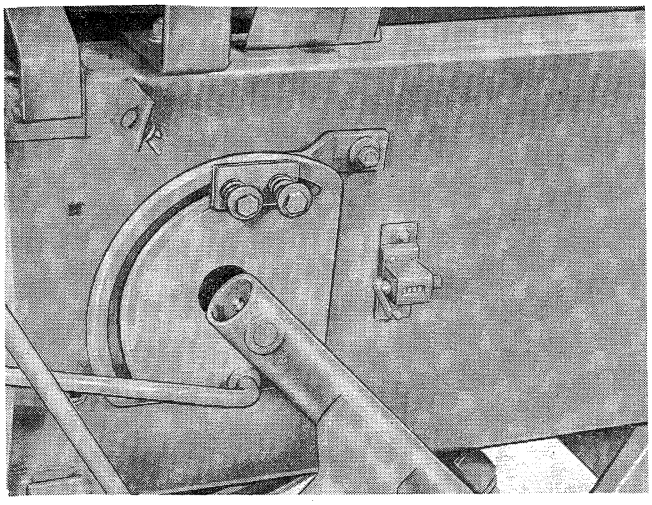


Figure 102
Bale Counter

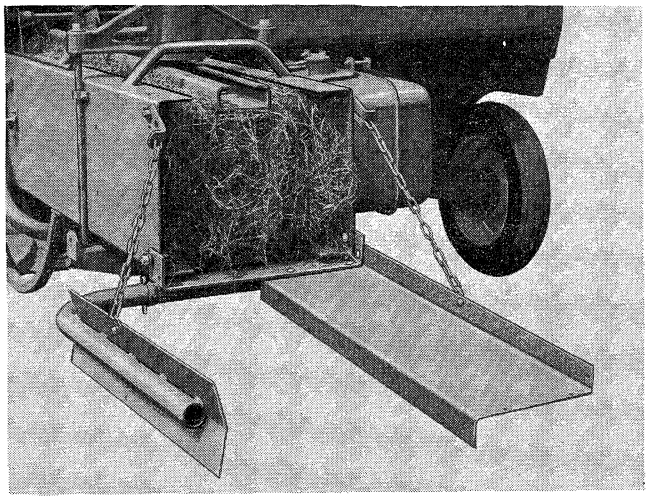


Figure 103
Quarter Turn Bale Chute

ACCESSORIES

A wide range of accessories are available for your baler from your Ford Tractor–Equipment Dealer. A brief description and illustration of each accessory is given below.

WAGON HITCH KIT AND BALE LOADING CHUTE

A Wagon Hitch Kit, Component 14-375, and a Bale Loading Chute, Component 14-388, Figure 101, is available for operators who desire to hitch a wagon to the baler and load bales directly onto the wagon.

QUARTER TURN BALE CHUTE

When the bales are moved out of the bale chamber, the Quarter Turn Bale Chute, Component 14-383, rolls the bales to either the right or left, as desired, to provide for more clearance and easier mechanical pick-up. The chute is shown installed in Figure 103.

WARNING LAMP

If there is the possibility that the baler will be on the road after dusk, it is strongly recommended that a warning lamp be purchased from your Ford Tractor–Equipment Dealer. This light should be used during all periods of insufficient road illumination when transporting the unlighted baler would create a serious safety hazard.

The warning lamp bracket and lamp are easily installed and powered by the tractor battery.

BALE CHAMBER WEDGE KIT

The Bale Chamber Wedge Kit, Component 14-347, provides additional bale density when baling light fluffy material such as straw. The kit consists of one pair of bale wedges for installation on the inside of the rear bale chamber, and one pair of cast bale retarders for installation on the upper and lower tension channels.

PICK-UP GAUGE WHEEL KIT

The Pick-Up Gauge Wheel, Component 14-374, Figure 104, mounts on the side of the pick-up reel assembly and carries some of the weight of the pick-up reel assembly. It prevents the pick-up teeth and guards from striking the ground when the baler is operating in rough terrain.

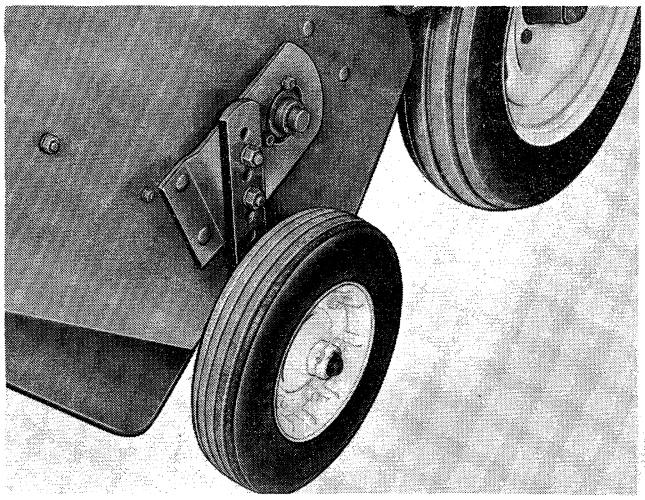


Figure 104
Pick-Up Gauge Wheel

BALE THROWER

A Bale Thrower, Component 14-T500, Figure 105, can be installed on your baler. The bale thrower reduces the time of the overall baling operation by tossing the bales directly into a rear attached wagon when they are moved out of the bale chamber. A Component 14-T500H, Hydraulic Thrower Control can be installed on the bale thrower to control the direction of the throw hydraulically. Installation instructions and operating information is provided with the bale thrower.

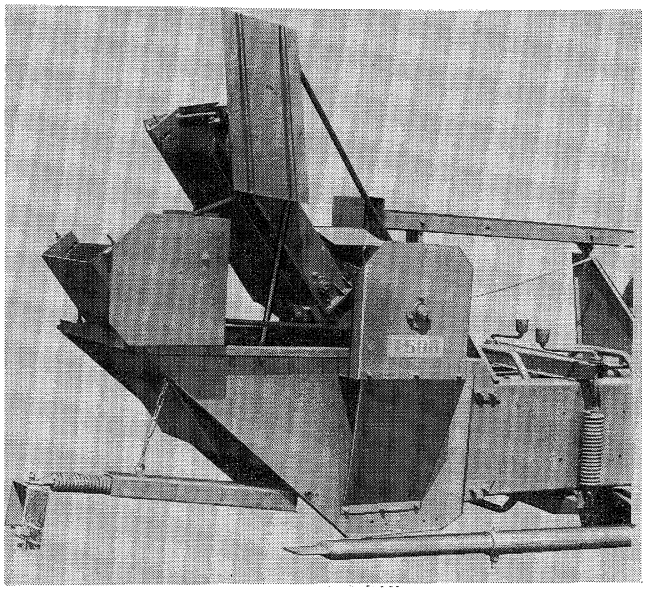


Figure 105
Bale Thrower

HYDRAULIC BALE TENSION ATTACHMENT

The Hydraulic Bale Tension Attachment, Component 14-376, regulates bale weight and density hydraulically. The hydraulic bale tension attachment is shown in Figure 106. The desired bale tension is obtained by adjusting the pressure regulating valve shown in Figure 107.

HYDRAULIC BALE TENSION ATTACHMENT OPERATION

The Hydraulic Bale Tension Attachment, Figure 106, is designed to provide a more effective means of controlling bale density. The desired bale tension is obtained hydraulically by adjusting the pressure regulating valve shown in Figure 106.

The pump is a self-contained gear pump and reservoir. A built-in relief valve protects the system from excessive pressure. The relief valve is tested and pre-set at the factory and requires no attention. The pressure regulating gauge, shown in Figure 106, indicates the working pressure. The hydraulic cylinder on the top tension channel maintains the work-pressure on the bales being formed in the bale chamber.

The filler cap, shown in Figure 107, is a combination air filter and tank breather.

FILLING THE SYSTEM

Prior to operating the bale tension attachment for the first time, fill and bleed the system as follows:

1. Fill the pump reservoir to within 1 inch of the filler opening with Ford M-2C-48A or SAE 10W-30 motor oil.

2. Turn the pressure regulating valve counterclockwise as far as it will go, then turn the valve clockwise two turns.

3. Start the baler and loosen the gauge from the top of the cylinder housing, Figure 106; when oil appears, tighten gauge.

4. Stop the baler and refill the reservoir to within 1 inch of the filler opening.

FIELD OPERATION

1. Open the valve (counterclockwise) to prevent a build-up of pressure in the event the baler is operated without material in the bale chamber.

2. Operate the baler until the bale chamber is filled with hay. Adjust the valve to 200 lbs. (average). Make a few bales and readjust the valve as required, to obtain the desired bale density.

NOTE: *It may be necessary to change the working pressure occasionally during the day as the condition of the hay changes.*

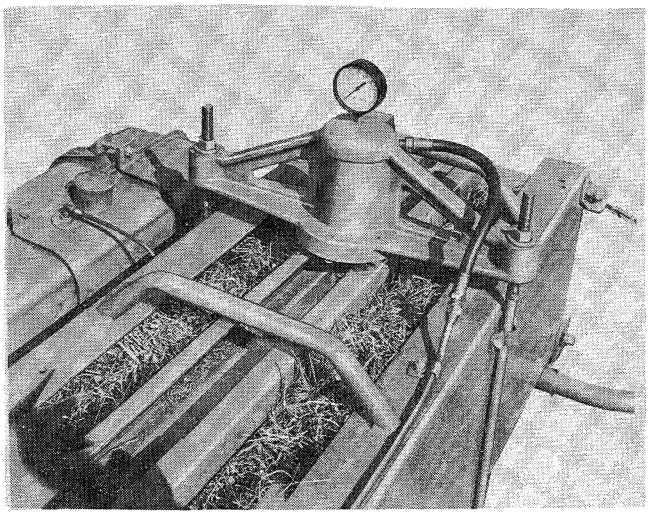


Figure 106
Hydraulic Bale Tension Attachment

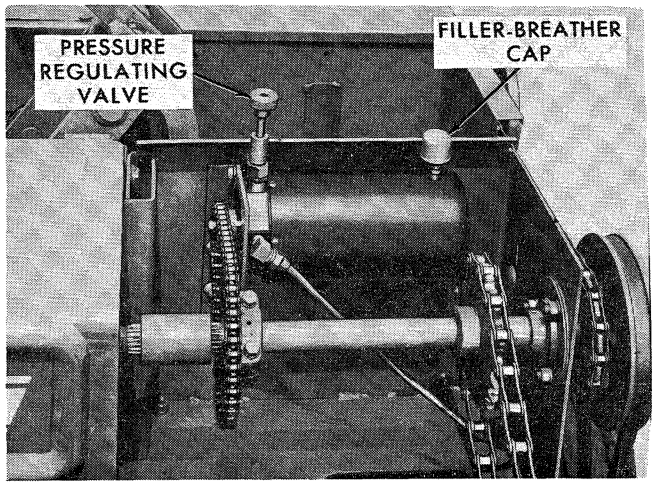


Figure 107
Hydraulic Bale Tension Pump

FINAL CHECK BEFORE FIELD OPERATION

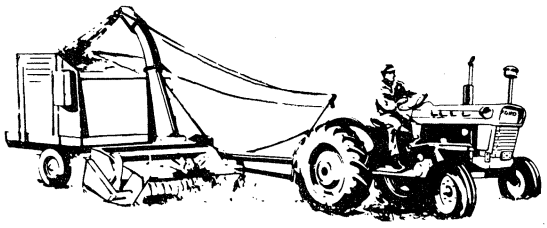
It is extremely important that your new Ford Hay Baler be properly serviced before it is taken into the field. After it has been completely assembled, the baler should be lubricated, adjusted and operated according to the following procedure.

1. Lubricate the baler as directed in the section on "Lubrication."
2. Check the baler carefully to be sure that it is properly adjusted as outlined in the sections on "Adjustments."
3. Check all chains and the belt for proper tension and alignment.
4. Check the air pressure ir the tires.
5. Trip the tying mechanism by rotating the metering wheel in the direction of the bale travel. Make sure that the clutch operates freely.
6. Turn the flywheel by hand in a counterclockwise direction several times to be sure that the needles and other parts move freely.
7. Check the main gear box oil level and fill to the level plug hole with SAE 140 E.P. oil.
8. Check the feed fork drive box grease level and fill to lever plug hole with ESEN MIC 137A.
9. Disengage the tractor P.T.O. and start the engine.

CAUTION: *To avoid accidents, be sure that the baler is free and clear and that no one is in a position to be injured when the machine is started.*

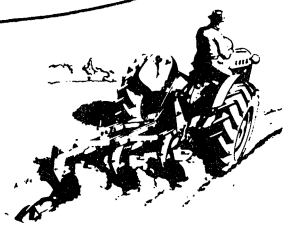
10. Burnish the clutch by rotating the flywheel with tractor power before completely releasing the pressure plate.
11. Release the clutch pressure plate by loosening the jam nuts and three square head set screws which hold the pressure plate away from the flywheel.
12. Review Safety Precautions to avoid injury during operation.

the SPOTLIGHT is on
FORD EQUIPMENT

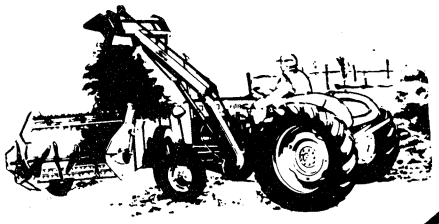


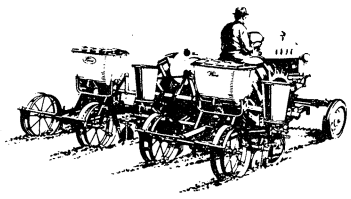
FORAGE HARVESTERS

PLOWS

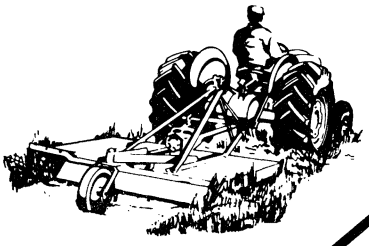


LOADERS

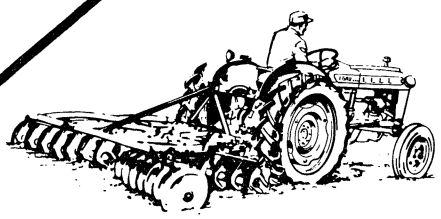




PLANTERS

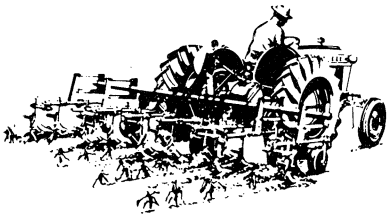


ROTARY HAY CUTTERS

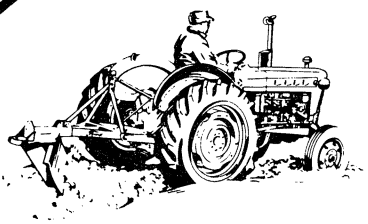


DISC HARROWS

CULTIVATORS

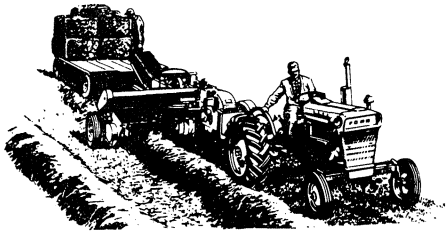


BLADES

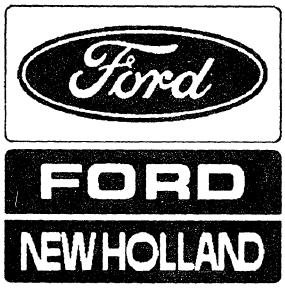


SEE YOUR LOCAL
FORD TRACTOR – EQUIPMENT DEALER

HAY BALERS



CORN PICKERS



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